NEC

NEC Express5800 Series

N8404-001F

Storage and I/O Blade AD106a
User's Guide

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Keep this User's Guide at hand for quick reference at anytime necessary.

SAFETY INDICATIONS

Follow the instructions in this User's Guide for your safety to use the Storage and I/O Blade.

The Storage and I/O Blade contains components with possible danger, hazards that may cause by ignoring warnings, and preventive actions against such hazards.

Server components with possible danger are indicated with a warning label placed on or around them as well as described in this User's Guide.

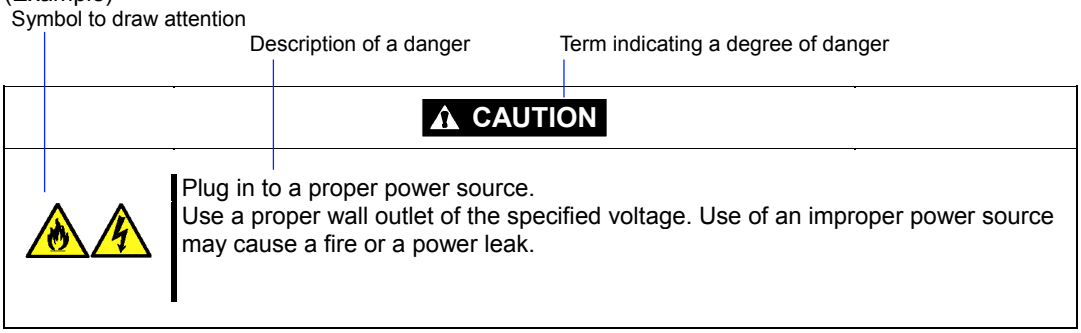
In the User's Guide or warning labels, "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

⚠ WARNING	Indicates the presence of a hazard that may result in death or serious personal injury if the instruction is ignored.
⚠ CAUTION	Indicates the presence of a hazard that may cause minor personal injury, including burns, or property damage if the instruction is ignored.

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type. (Attention)
	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action. (Prohibited Action)
	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard. (Mandatory Action)

(Example)
(Example)


Symbol to draw attention
Description of a danger
Term indicating a degree of danger
⚠ CAUTION
Plug in to a proper power source.
Use a proper wall outlet of the specified voltage. Use of an improper power source may cause a fire or a power leak.

SYMBOLS USED IN THIS MANUAL AND WARNING LABELS

Attentions

	Indicates that improper use may cause an electric shock.
	Indicates that improper use may cause fumes or fire.
	Indicates that improper use may cause fingers to be caught.
	Indicates that improper use may cause personal injury.
	Indicates that improper use may cause explosion.
	Indicates that improper use may cause personal injury due to high temperature.
	Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

	Do not disassemble, repair, or modify the Storage and I/O Blade. Otherwise, an electric shock or fire may be caused.
	Keep away from water or liquid. Otherwise, an electric shock or fire may be caused.
	Keep away from fire. Otherwise, an ignition may be caused.
	Do not touch the Storage and I/O Blade with wet hand. Otherwise, an electric shock may be caused.
	Do not touch any component other than specified. Otherwise, an electric shock or personal injury such as burns may be caused.
	Indicates a general prohibited action that cannot be specifically identified.

Mandatory Action

	Unplug the power cord of the CPU Blade. Otherwise, an electric shock or fire may be caused.
	Be sure to provide earthing. Otherwise, an electric shock or fire may be caused.
	Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

BSMI Statement

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Momentary voltage drop prevention:

This product may be affected by a momentary voltage drop caused by lightning. To prevent a momentary voltage drop, an AC uninterruptible power supply (UPS) unit should be used.

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PREFACE

Welcome to the Storage and I/O Blade for NEC Express5800/SIGMABLADE.

Connecting the Storage and I/O Blade with the CPU blade can expand I/O capabilities with up to six hard disk drives and two mezzanine cards.

Read this User's Guide thoroughly to fully understand handling of the Storage and I/O Blade and appreciate its functions to the maximum extent.

ABOUT THIS USER'S GUIDE

This User's Guide is a guide for proper setup and use of the Storage and I/O Blade.

This User's Guide also covers useful procedures for dealing with difficulties and problems that may arise during setup or operation of the Storage and I/O Blade.

Keep this manual for future use.

The following describes how to proceed with this User's Guide.

How to Use This User's Guide

To aid you in finding information quickly, this User's Guide contains the following information:

Chapter 1 Notes on Using Your Storage and I/O Blade
includes information that needs attention to use the CPU blade and Storage and I/O Blade. Make sure to read this chapter before setting up and using the CPU blade and Storage and I/O Blade. It also includes requirements and advisory information for transfer and disposal of the Storage and I/O Blade.

Chapter 2 General Description
includes information necessary to use the Storage and I/O Blade, such as names and functions of its components.

Chapter 3 Setting Up Your Storage and I/O Blade
tells you how to check MAC address, and procedure to install the Storage and I/O Blade in Blade Enclosure.

Chapter 4 Configuring Your Storage and I/O Blade
tells you how to configure the RAID system with the hard disk drives in Storage and I/O Blade.

Chapter 5 Installing the Operating System
describes how to install the device drivers for the Storage and I/O Blade.

Chapter 6 Installing and Using Utilities
Refer to the User's Guide of the CPU Blade contained in the NEC EXPRESSBUILDER DVD

Chapter 7 Maintenance
provides you with all the information necessary to maintain successful operation of the Storage and I/O Blade.

Chapter 8 Troubleshooting
contains helpful information for solving problems that might occur with your system.

Chapter 9 Upgrading Your Storage and I/O Blade
provides you with instructions for upgrading your system with optional mezzanine cards, and hard disk drives.

Appendix A Specification
provides specifications for your Storage and I/O Blade.

Text Conventions

The following conventions are used throughout this User's Guide. For safety symbols, see "SAFETY INDICATIONS" provided earlier.

IMPORTANT:	Items that are mandatory or require attention when using the Storage and I/O Blade
NOTE:	Helpful and convenient piece of information

IN THE PACKAGE

The carton contains various accessories, as well as the Storage and I/O Blade itself. See the packing list to make sure that you have everything and that individual components are not damaged. If you find any component missing or damaged, contact your service representative.

- Store the provided accessories in a designated place for your convenience. You will need them to install an optional device or troubleshoot the Storage and I/O Blade, as well as to set it up.
- Make a backup copy of each provided floppy disk, if any. Store the original disk as the master disk in a designated place, and use its copy.
- Improper use of any provided floppy disk or CD-ROM may alter your system environment. If you find anything unclear, immediately ask your service representative for help.

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Chapter 1

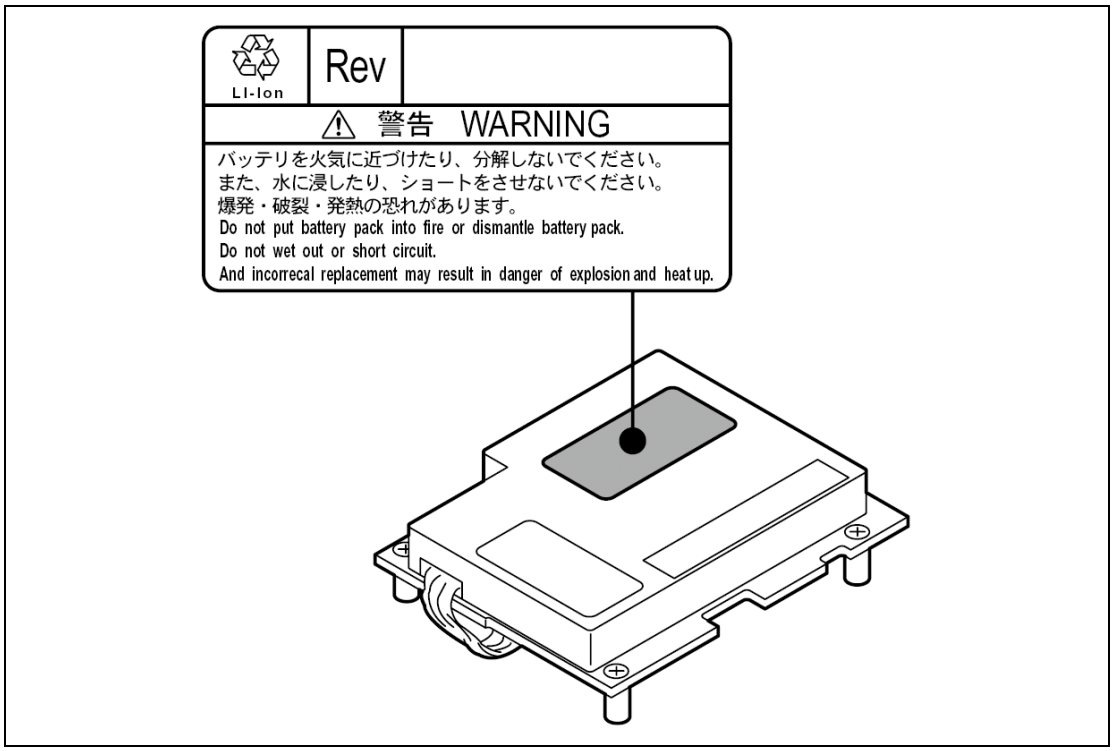
Notes on Using Your Storage and I/O Blade

This chapter includes information necessary for proper and safe operation of the Storage and I/O Blade.

WARNING LABELS

The warning label is attached to components with possible danger or their vicinity in your blade to inform the user that a hazardous situation may arise when operating the blade. (Do not intentionally remove or damage any of the labels.)

If you find any labels totally/partially removed or illegible due to damage, contact your service representative.


LI-Ion
Rev
⚠ 警告 WARNING
バッテリを火気に近づけたり、分解しないでください。
また、水に浸したり、ショートをさせないでください。
爆発・破裂・発熱の恐れがあります。
Do not put battery pack into fire or dismantle battery pack.
Do not wet out or short circuit.
And incorrecal replacement may result in danger of explosion and heat up.

SAFETY NOTES

This section provides notes on using the Storage and I/O Blade safely. Read this section carefully to ensure proper and safe use of the Storage and I/O Blade. For symbols, see "SAFETY INDICATIONS" provided earlier.

For part names described in the safety instruction chapter in this guide, refer to "Features and Controls" in Chapter 2.

⚠ WARNING

Do not use the Storage and I/O Blade for services where critical high availability may directly affect human lives.

The Storage and I/O Blade is not intended to be used with or control facilities or devices concerning human lives, including medical devices, nuclear facilities and devices, aeronautics and space devices, transportation facilities and devices; and facilities and devices requiring high reliability. NEC assumes no liability for any accident resulting in personal injury, death, or property damage if the Storage and I/O Blade has been used in the above conditions.

Do not disassemble, repair, or alter the Storage and I/O Blade.

Never attempt to disassemble, repair, or alter the Storage and I/O Blade on any occasion other than described in this User's Guide. Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the Storage and I/O Blade.

Do not remove the battery.

Your Storage and I/O Blade contains the lithium and Li-Ion batteries. Do not remove the battery. Danger of explosion if the battery is incorrectly replaced. Placing the battery close to a fire or in the water may cause an explosion.

When the Storage and I/O Blade does not operate appropriately due to the dead batteries, contact your service representative to replace the battery. Do not disassemble the Storage and I/O Blade to replace or recharge the battery by yourself.

Do not use the Storage and I/O Blade if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the system and disconnect the power plug from the outlet, then contact your service representative. Using the Storage and I/O Blade in such conditions may cause a fire.

Keep needles or metal objects away from the Storage and I/O Blade .

Do not insert needles or metal objects into ventilation holes in the Storage and I/O Blade . Doing so may cause an electric shock.

Use the devices only in the specified areas.

CPU blades and Storage and I/O Blade should be installed in the dedicated Blade Enclosure for their uses. Do not install the CPU blades and Storage and I/O Blade in a chassis other than the Blade Enclosure. Failure to follow it may result in fire and/or electric shock to occur.

⚠ WARNING

Do not use the equipment in the place where corrosive gases exist.

Make sure not to locate or use the CPU blade and Storage and I/O Blade in the place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist.
Also, do not set it in the environment where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals. There is a risk of a fire due to corrosion and shorts of an internal printed board.

Do not handle the CPU blade or Storage and I/O Blade while it is installed in the Blade Enclosure.

To install or remove an option from the CPU blade or Storage and I/O Blade, first turn off the power of the CPU blade and remove the CPU blade and Storage and I/O Blade from the Blade Enclosure. If you touch parts on the CPU blade or Storage and I/O Blade with it connected to the Blade Enclosure, you may get an electric shock.

Do not install or remove more than one Storage and I/O Blade at a time.

Install or remove Storage and I/O Blade one by one. If you install or remove more than one Storage and I/O Blades at a time or a Storage and I/O Blade with the cover of another slot removed, you may be electrically shocked.

⚠ CAUTION

Keep water or foreign matter away from the CPU blade and Storage and I/O Blade.

Do not let any form of liquid (water etc.) or foreign matter (e.g., pins or paper clips) enter the CPU blade and Storage and I/O Blade. Failure to follow this warning may cause an electric shock, a fire, or a failure of the CPU blade and Storage and I/O Blade. When such things accidentally enter the CPU blade and Storage and I/O Blade, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the CPU blade and Storage and I/O Blade. Contact your service representative.

Make sure to complete device installation.

Always install a CPU blade, Storage and I/O Blade, hard disk drive, and option board firmly. An incompletely installed device may cause a contact failure, resulting in smoking or fire.

Do not use any unauthorized interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.
Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the Blade Enclosure with loose cable connections.
- Do not use any damaged cable.

CAUTION

Avoid installation in extreme temperature conditions.

Immediately after the Storage and I/O Blade is powered off, its internal components and components in Blade Enclosure are very hot. Leave them until their internal components fully cool down before installing/removing any component.

Avoid contact with the CPU blade and Storage and I/O Blade during thunderstorms.

Disconnect the power plug from the outlet when a thunderstorm is approaching. If it starts thundering before you disconnect the power plug, do not touch any part of the CPU blade and Storage and I/O Blade including the cables. Failure to follow this warning may cause a fire or an electric shock.

Keep animals away from the CPU blade and Storage and I/O Blade.

Pet's discharges or fur may enter the CPU blade and Storage and I/O Blade and cause a fire or electric shock.

Do not use a cellular phone or pager around the CPU blade and Storage and I/O Blade.

Turn off the cellular phone or pager. Radio interference may cause malfunctions of the CPU blade and Storage and I/O Blade.

FOR PROPER OPERATION

Observe the following notes for successful operation of the Storage and I/O Blade. Use of the Storage and I/O Blade ignoring the notes will cause malfunctions or failures of the Storage and I/O Blade .

- Storage and I/O Blade
  - The Storage and I/O Blade must be installed in the Blade Enclosure (SIGMABLADE).
  - Install or remove Storage and I/O Blades one by one.
  - Hold the portions covered with metal plates when a Storage and I/O Blade is installed or removed. To carry a Storage and I/O Blade, put it into the case in which the Storage and I/O Blade was contained at the purchase and pack it into the package.
  - The Storage and I/O Blade is extremely sensitive to static electricity. Make sure to touch the metal frame of the chassis to discharge static electricity from your body before handling the Storage and I/O Blade. Do not touch the Storage and I/O Blade terminals or onboard parts by a bare hand and place the Storage and I/O Blade directly on the desk.
  - Store the unit under the storage condition (temperature: –10 to 55°C, humidity: 20 to 80%, without condensation) to allow built-in devices and the unit to operate correctly in the next operation.
  - The power of the Storage and I/O Blade is controlled by the CPU blade connected.
  - The Storage and I/O Blade contains precision component that is easily affected by drastic temperature change. If the Storage and I/O Blade is used after storage or relocation, make sure that the Storage and I/O Blade is fully adapted to the operating environment.
  - Turn on the power of each CPU blade by the use of the POWER switch or the remote power-on after the period of 30 seconds or longer has passed from the supply of AC power (the POWER lamp of the CPU blade goes on amber) to every power unit. The power of the CPU blade may not be turned on if the power-on operation is done within the period of less than 30 seconds from the supply of AC power. After making sure that the AC power is supplied to every power unit, turn on the power of each CPU blade by using the POWER switch.
  - Remove the Storage and I/O Blade after making sure that the CPU blade has been powered off.

- Optional hard disk drive, mezzanine card, and other electronic components
  - These components are extremely sensitive to static electricity. Make sure to touch the metal frame of the chassis to discharge static electricity from your body before handling the components. Do not touch the terminals or parts on the components by a bare hand and place the components directly on the desk.
  - Make sure that the options are optional devices for the purchased Storage and I/O Blade. If an option can be installed or connected to the Storage and I/O Blade, the option may not operate properly and further the Storage and I/O Blade itself may be defected.
  - The internal option device contains precision component that is easily affected by drastic temperature change. If the device is used after storage or relocation, make sure that the device is fully adapted to the operating environment.
- Do not use a cellular phone or pager around the Storage and I/O Blade.

  Turn off the cellular phone or pager. Radio interference may cause malfunctions of the Storage and I/O Blade.

TRANSFER TO THIRD PARTY

The following must be observed when you transfer (or sell) the Storage and I/O Blade or software provided with the Storage and I/O Blade to a third party:

Storage and I/O Blade

Make sure to provide this manual along with the Storage and I/O Blade to a third party.

IMPORTANT: About data on the hard disk drive

Be sure to take appropriate measures not to leak important data (e.g., customers' information or companies' management information) on the removed hard disk drive to any third parties.

Data seems to be erased when you empty "Recycle Bin" of Windows or execute the "format" command of the operating system. However, the actual data remains written on the hard disk drive. Data not erased completely may be restored by special software and used for unexpected purposes.

It is strongly recommended that the software or service (both available at stores) for data erasure should be used in order to avoid the trouble explained above. For details on data erasure, ask your sales representative.

Provided Software

To transfer or sell any software application that comes with the Storage and I/O Blade to a third party, the following requirements must be satisfied:

- All provided software applications must be transferred and no backup copies must be retained.
- Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.
- Software applications that are not approved for transfer must be uninstalled before transferring the Storage and I/O Blade.

DISPOSAL AND CONSUMABLES

- Dispose of the CPU Blade, Storage and I/O Blade, hard disk drives, Blade Enclosure, option board, floppy disks, and DVD/CD-ROMs according to all national laws and regulations.

IMPORTANT:

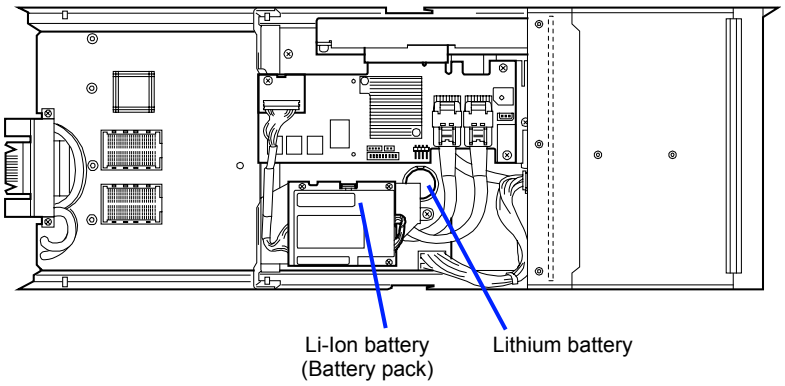
- For disposal (or replacement) of the battery on the mother board of the Storage and I/O Blade, consult with your service representative.
- It is the user's responsibility to completely erase or modify all the data stored in storage device such as hard disk drive so that the data cannot be restored.

- The Storage and I/O Blade contains some components that are only good for a limited period of time and require replacement (e.g., lithium or Li-Ion battery). For stable operation of the Storage and I/O Blade, NEC recommends you replace these components on a regular basis. Consult with your service representative for replacement or the product lives.

⚠ WARNING

Do not remove the battery.

The Storage and I/O Blade contains the lithium and Li-Ion batteries. Do not remove the battery. Placing the battery close to a fire or in the water may cause an explosion.
For the location of battery on the option board, refer to the manual that comes with the option board.



Storage and I/O Blade

USER SUPPORT

Before Asking for Repair, do the following when the Storage and I/O Blade appears to fail:

1. Check if the power cord and the cables to other devices are properly connected.
2. See Chapter 8 to find if your problem fits the description. If it does, take the recommended measure for it.
3. Check if the software required for operation of the Storage and I/O Blade is properly installed.

If the Storage and I/O Blade still appears to fail after you have taken the above actions, consult with your service representative immediately. Take notes on lamp indications of the Storage and I/O Blade and alarm indications on the display unit before consultation, which may provide a significant help to your service representative.

Advice for Health

The longer you keep using the computer equipment, the more you become tired, which may cause disorders of your body. When you use a computer, observe the following to keep yourself from getting tired:

Good Working Posture

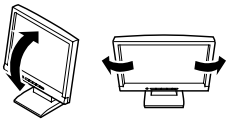
You have good posture if the following are satisfied when you use a computer:

- You sit on a chair with your back straight.
- Your hands are parallel with the floor when you put them on the keyboard.
- You look at the screen slightly lower than your eye height.

You have "good working posture" as described in the above when no part of your body is under excess strain, in other words when your muscles are most relaxed.

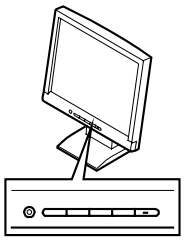
You have "bad posture" when you sit with your back hunched up or you operate a display unit with your face close to the screen. Bad working posture may cause eye strain or poor eyesight.

Adjustment of Display Unit Angles



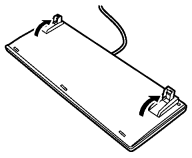
Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. You will not be able to keep "good working posture" and you will feel more tired than you should if you operate a display unit without adjusting horizontal and vertical angles.

Adjustment of Screen Brightness and Contrast

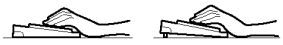


The display unit has brightness and contrast adjustment functions. The most suitable brightness and contrast depend on the individual and the working environment (well-lighted room or insufficient light). Adjust brightness and contrast so that the screen will be easy to see. An extremely bright or dark screen will give a bad effect to your eyes.

Adjustment of Keyboard Angle



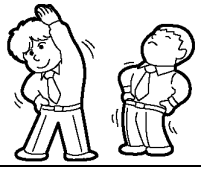
The keyboard provided with the CPU Blade is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



Cleaning of Equipment

Clean equipment regularly. It is difficult to see the display contents on a dusty screen. Keeping equipment clean is also important for your sight.

Fatigue and Rest



If you feel tired, you should stop working and do light exercises.

Chapter 2

General Description

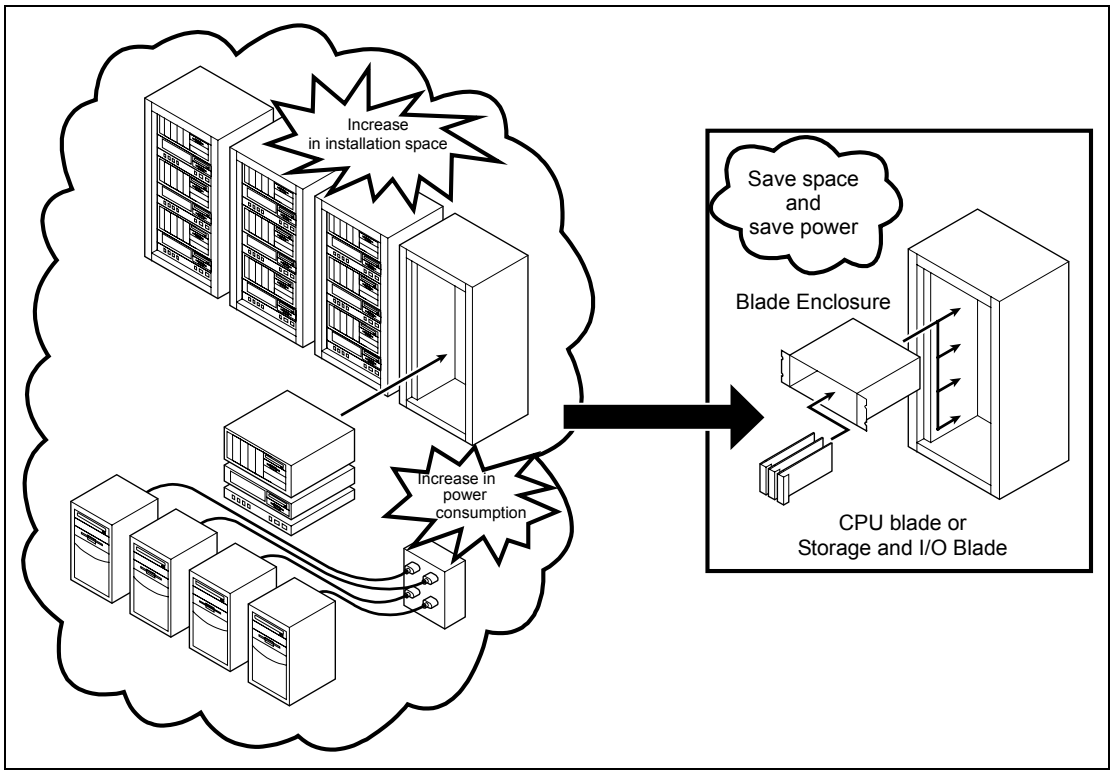
This chapter provides information that you should be familiar with before using the Storage and I/O Blade. It includes names and functions of the components and features of the Storage and I/O Blade.

OVERVIEW

NEC Express5800/SIGMABLADE is a modular and multiprocessing system that includes processor, memory, network connections, optional add-in card slot, and associated electronics, all on a single mother board called a CPU blade.

The CPU blade, hard disk drive, and other CPU blades are typically installed into a rack-mountable enclosure that houses multiple CPU blades that share common resources such as cabling, power supplies, and cooling fans.

This high-density technology reduces the installation space, lowers a total cost of ownership, and offers increased computing density while ensuring both maximum scalability and ease of management.



The Storage and I/O Blade and hard disk drives contained in the Storage and I/O Blade do not require any power cord and cables to connect with the CPU blade. In addition, the Storage and I/O Blade can contain optional mezzanine cards for blade.

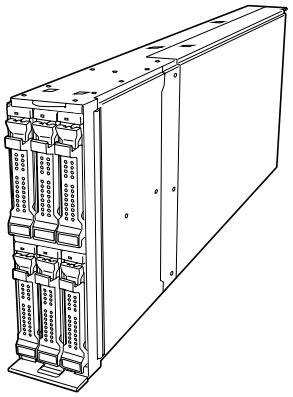
STANDARD FEATURES

High performance

- High-speed 1000BASE-T interface x2 (1Gbps supported)
- High-speed disk access (SAS)

High-reliability

- Temperature detection
- Error notification
- Internal voltage monitoring feature
- BIOS password feature
- Auto-rebuild feature (hot-swappable)



Expandability

- Equipped with option slot that makes up to two additional slot option cards available.
- Two network ports
- Up to six hard disk drives (SAS 2.5-inch) can be connected

Management Utilities

- NEC ESMPRO
- Universal RAID Utility
- Monitoring of system status through EM card

Maintenance Features

- Off-line Maintenance Utility
- Configuration on Disk feature

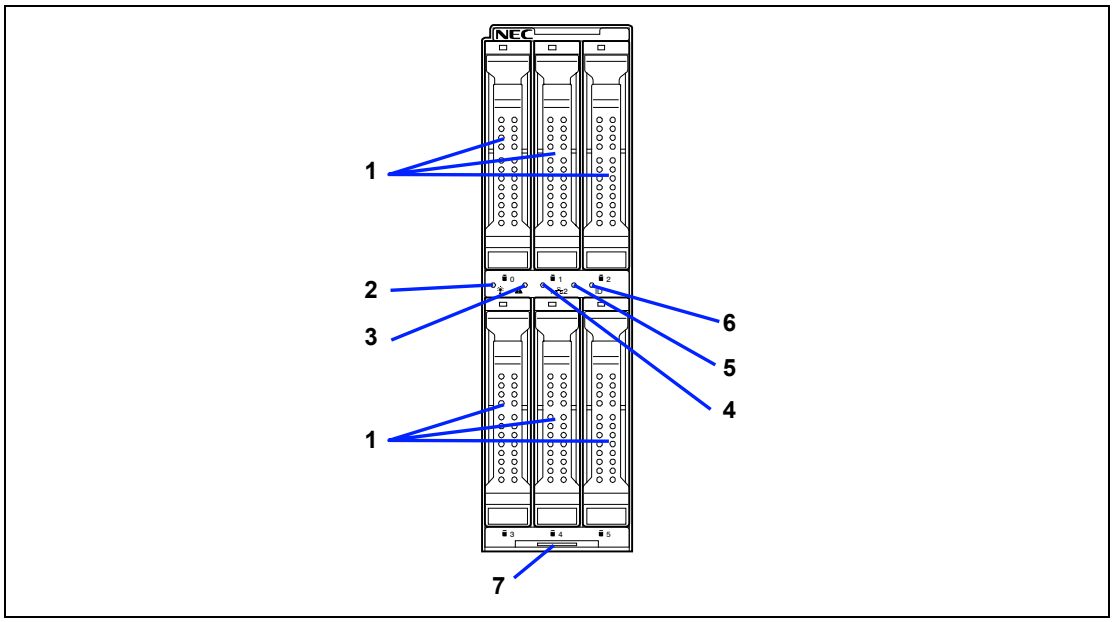
Easy to use

- Cable-less SAS HDD

NAMES AND FUNCTIONS OF COMPONENTS

This section describes the names and features of the components in the device.

Front View



1 Hard disk drive
Upper: Slots 0, 1, and 2 from left to right
Lower: Slots 3, 4, and 5 from left to right

2 POWER lamp
The lamp goes on green when the Storage and I/O Blade is powered on.
The lamp goes on amber when the Storage and I/O Blade is powered off but the power is supplied from the power supply unit.

3 STATUS lamp (green/amber/red)
The lamp indicates the status of the Storage and I/O Blade. See "Lamp Indications" described later for the indications and meanings of the lamp.

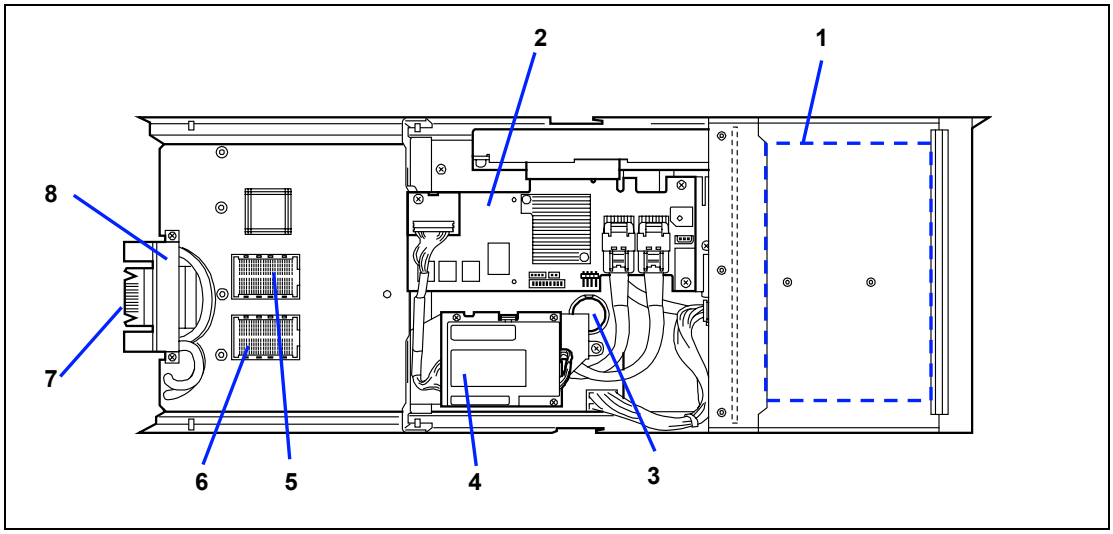
4 LAN1 Link/Access lamp (green)
The lamp lights when LAN port 1 is connected to the network.
The lamp flashes when data is being transmitted.

5 LAN2 Link/Access lamp (green)
The lamp lights when LAN port 2 is connected to the network.
The lamp flashes when data is being transmitted.

6 ID lamp (blue)
The lamp is intended to identify the Storage and I/O Blade in the system. The lamp is lit by a software command.

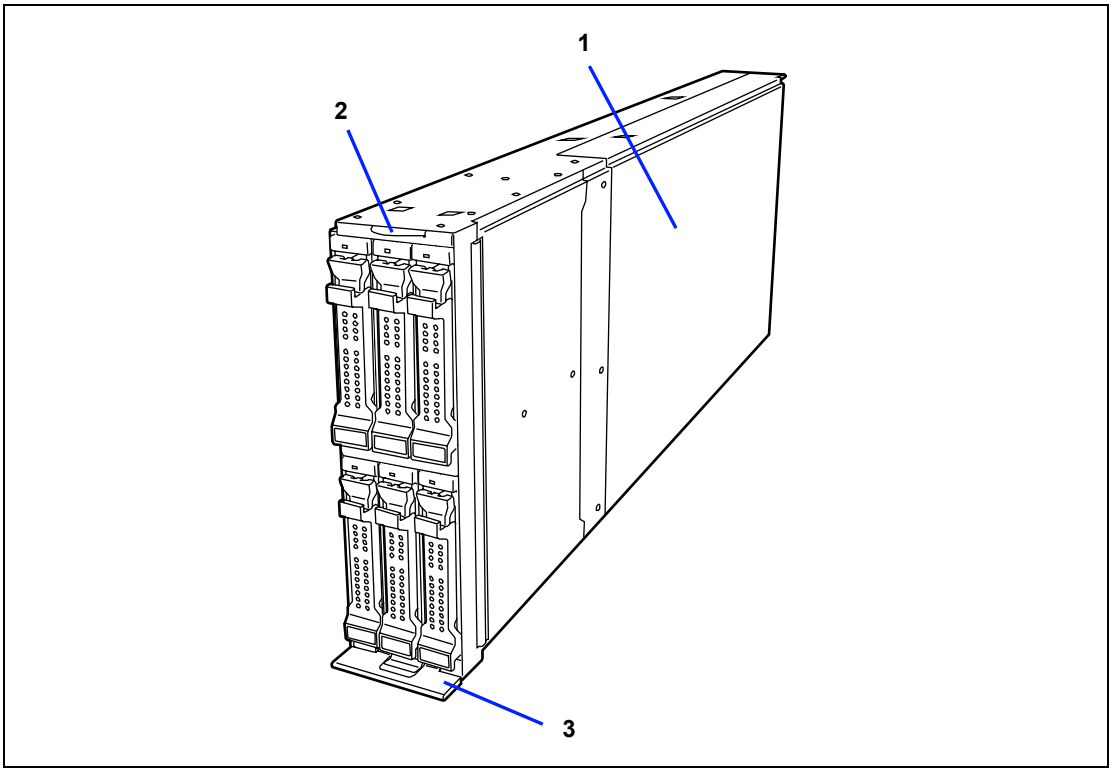
7 Eject lever
Pull the lever to remove the Storage and I/O Blade from the Blade Enclosure.

Internal View



1 **Hard disk drive slot**
2 **RAID controller**
3 **Lithium battery**
4 **Battery for RAID controller**
5 **Type I mezzanine slot**
Slot to install mezzanine card for blade
6 **Type II mezzanine slot**
Slot to install mezzanine card for blade
7 **MP connector**
Used to connect with the midplane in Blade Enclosure.
8 **MAC address label**

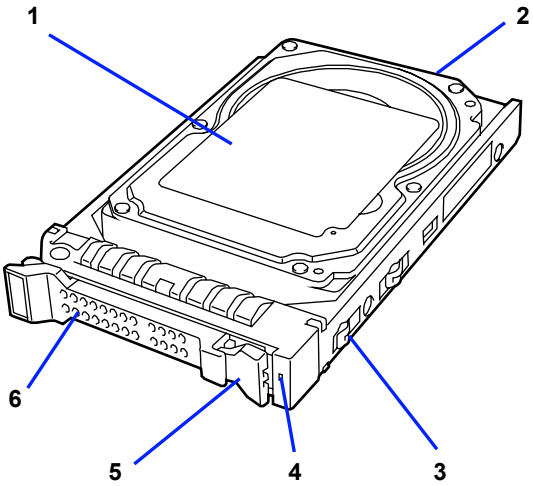
External View



1 Top cover
2 Slide tag
3 Eject lever

Hard Disk Drive

The hard disk drive is an optional device. Hard disk drive is sensitive to static electricity, vibration, and shock. Handle it carefully.



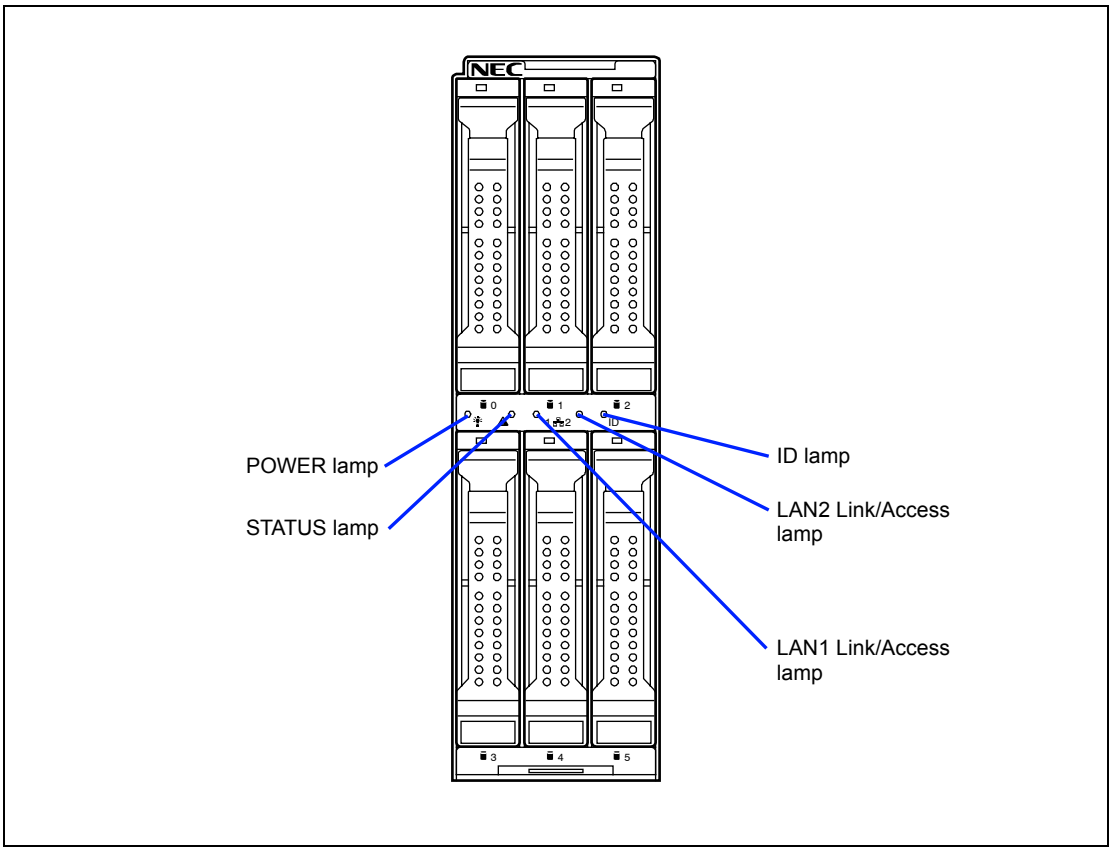
1 **Hard disk drive**
2 **BP connector**
Used to connect with the HDD backplane in Storage and I/O Blade.
3 **Drive carrier**
4 **Disk access lamp (green/amber)**
Lights green in accessing to a hard disk drive.
Lights amber if a fault occurs in a hard disk drive. Blinks green or amber alternately or blinks amber while array disks are rebuilt.
5 **Lever**
The lever is intended to unlock the hard disk drive. Pull the lever to remove the hard disk drive.
6 **Handle**
Hold the handle when the hard disk drive is installed or removed.

Lamp Indications

This section describes the positions and display meanings of the lamps on the Storage and I/O Blade and other devices.

Storage and I/O Blade

The Storage and I/O Blade includes five lamps.



POWER Lamp

The POWER lamp lights green while the power of the Storage and I/O Blade is on. The lamp lights amber when the Storage and I/O Blade is powered off but the power is supplied from the power supply unit in Blade Enclosure. The lamp is off if the power is not supplied to the Storage and I/O Blade.

STATUS Lamp

The STATUS lamp stays lit in green when the Storage and I/O Blade is in successful operation. When the STATUS lamp is flashing in amber or red, it indicates that the system has failed.

In addition, you can view the detailed information on error message on virtual LCD when the STATUS lamp is flashing in amber or red. You can use the virtual LCD through the Web console of Blade Enclosure. See Chapter 8 for indication on virtual LCD, descriptions, and actions to take. If an error occurs, contact your service representative.

The following tables list indications of the STATUS lamp, descriptions, and actions to take.

NOTE: The Storage and I/O Blade does not support EXPRESSSCOPE Engine (BMC). You cannot view the error log through NEC ESMPRO Manager.

STATUS lamp indications

STATUS lamp		Description	Action
Status	**Color**		
On	Green	The Storage and I/O Blade is operating normally.	–
Off	–	The power is turned off.	Turn on the power.
On	Red	BMC is being initialized.	1. Wait until the lamp goes off. 2. If the lamp still goes on, check installation of the Storage and I/O Blade.
Flash	Red	See the table "Virtual LCD indications when STATUS lamp is flashing in red" described in Chapter 8.	
Flash	Amber	See the table "Virtual LCD indications when STATUS lamp is flashing in amber" described in Chapter 8.	

NOTE: If the Storage and I/O Blade is powered off while the STATUS lamp is flashing in amber or red, the indication of the STATUS lamp is retained except for certain factors. When the Storage and I/O Blade is powered on, the STATUS lamp goes on green (normal status).

LAN (1 - 2) Link/Access Lamps

The lamp flashes when data is being transmitted through each LAN port. When the power is supplied to the Storage and I/O Blade from the Blade Enclosure and the link is established, the Link/Access lamp on the relevant port lights.

The connection of LAN port is physically controlled by the EM card and the switch module installed in the Blade Enclosure (SIGMABLADE).

To check connection status of LAN port, refer to the User's Guide of the EM card and the switch module installed in the Blade Enclosure.

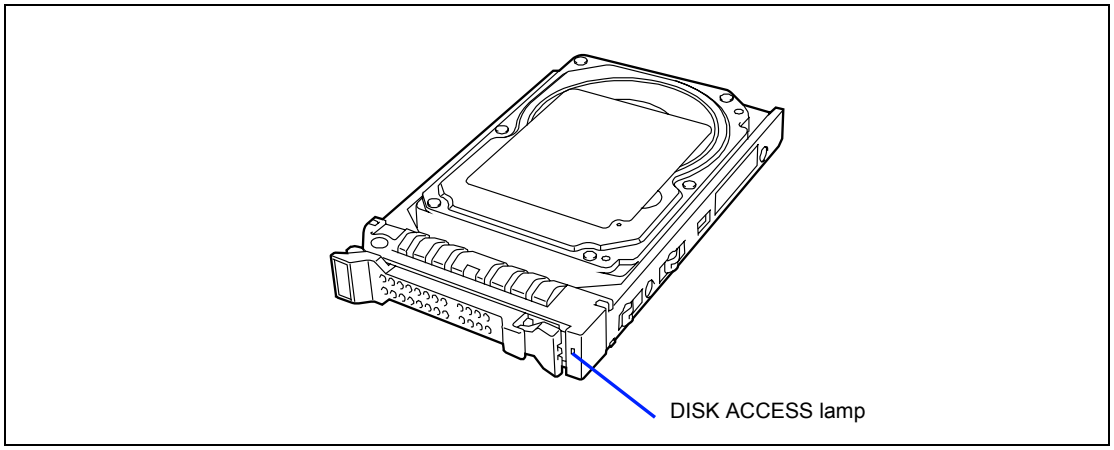
ID Lamp

The ID lamp is intended to identify a specific Storage and I/O Blade in the system in which several blades are installed. Making this lamp being lit can help the maintenance work to identify the faulty device.

When the detect command is received from management software such as NEC ESMPRO Manager and Web console of Blade Enclosure, the lamp lights.

DISK ACCESS Lamp

A hard disk drive has one lamp.



The lamp lights green while the hard disk drive is being accessed.

The lamp lights amber if a hard disk drive cannot be interfaced with the Storage and I/O Blade correctly due to a hardware fault in the Storage and I/O Blade or another failure.

In the disk array configuration, the lamp flashes green and amber alternately while the array disks are rebuilt (this does not indicate an error). After the rebuilding completes, the lamp returns to the normal indication. If the rebuilding fails, the lamp is lit amber.

USING YOUR STORAGE AND I/O BLADE

This section describes the basic operation of the Storage and I/O Blade.

The power of the Storage and I/O Blade is automatically controlled in linkage with the power of CPU blade. Refer to the manual that comes with your CPU blade for power on/off of the Storage and I/O Blade.

Power-on of Storage and I/O Blade

The power of the Storage and I/O Blade is automatically controlled in linkage with the power of the connected CPU blade. Refer to the manual that comes with your CPU blade to power on the Storage and I/O Blade.

IMPORTANT: Perform the power-on operation of the CPU blade by either the use of the POWER switch or the remote power-on after the period of 30 seconds or longer has passed from the supply of AC power to CPU blade and Storage and I/O Blade. The POWER lamps on CPU blade and Storage and I/O Blade goes on amber if they are powered on. The power-on operation within the period of 30 seconds from the supply of AC power to them may not turn on the power of the CPU blade. If so, turn on the power of the CPU blade by using the POWER switch after making sure that the AC power is supplied to CPU blade and Storage and I/O Blade.

NOTE: If a power cord on the Blade Enclosure is connected to a power controller including an uninterruptible power supply (UPS), make sure that the power of the power controller is turned on.

Power-off of Storage and I/O Blade

The power of the Storage and I/O Blade is automatically controlled in linkage with the power of the connected CPU blade. Refer to the manual that comes with your CPU blade to power off the Storage and I/O Blade.

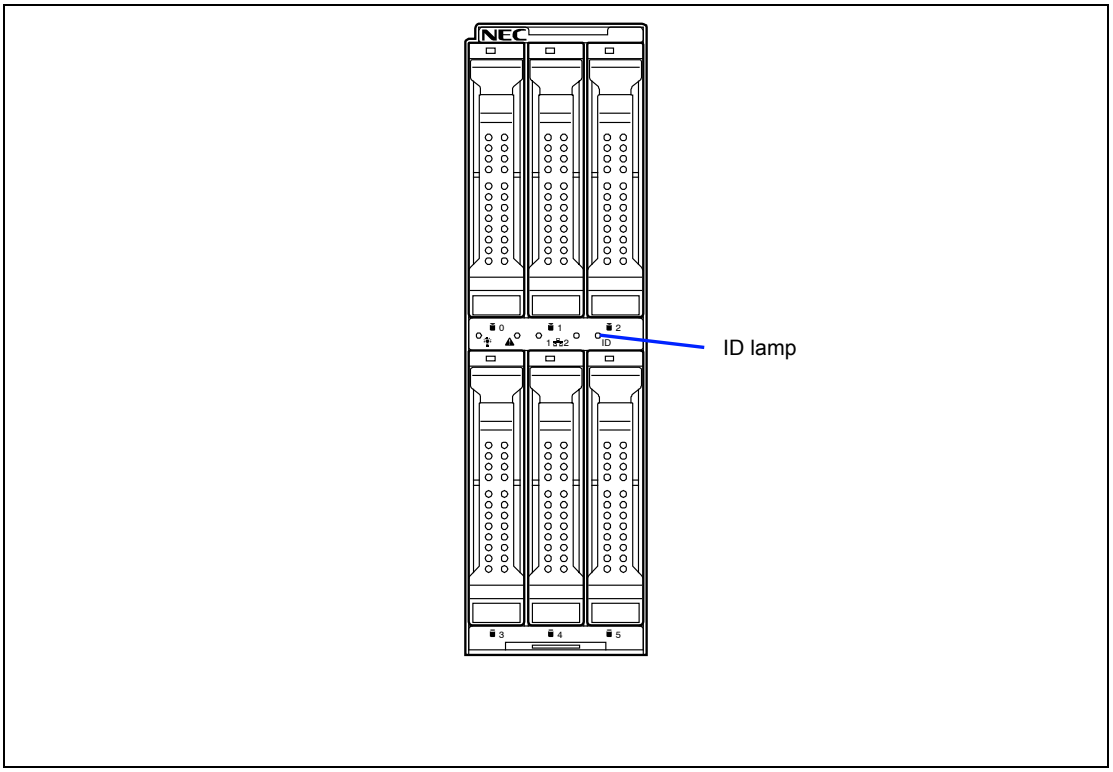
Device Identification

To identify the device to be maintained among more than one device, ID lamp is used.

The ID lamp is located on the blade device installed in the Blade Enclosure.

The ID lamp allows you to identify the device subject to maintenance among several devices installed in the Blade Enclosure.

The ID lamp on Storage and I/O Blade can also be made lit blue by proper software commands (e.g., NEC ESMPRO Manager or Web console of Blade Enclosure) from the management PC on the network.



Chapter 3

Setting Up Your Storage and I/O Blade

This chapter describes how to set up the Storage and I/O Blade appropriate for your system, on a step-by-step basis.

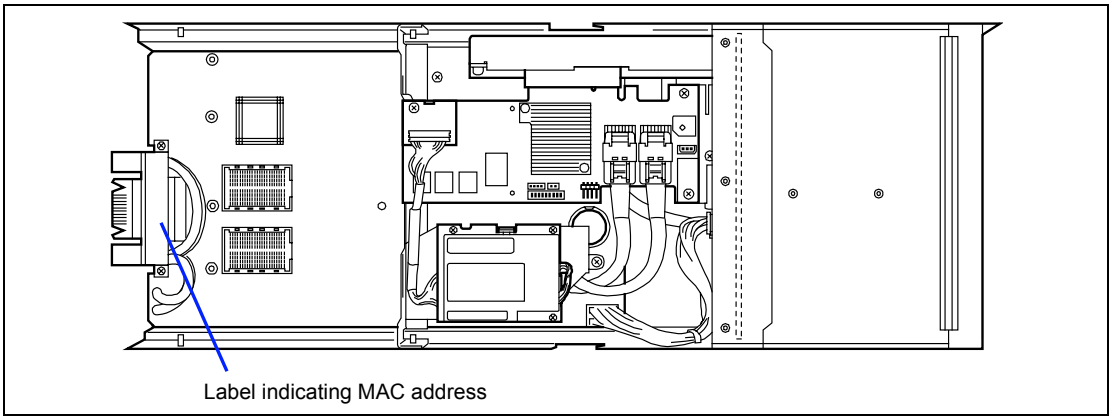
BEFORE INSTALLING STORAGE AND I/O BLADE

Be sure to check the MAC addresses before installing a Storage and I/O Blade in the Blade Enclosure.

Check of MAC Address

A MAC address indicates the address specific for the network. It is expressed by 12-digit alphanumeric. Each of the Storage and I/O Blade has two MAC addresses. Check the MAC addresses before installing the Storage and I/O Blade in the Blade Enclosure.

A MAC address is indicated in the area as shown in the figure below.



The address of LAN port depends on the numeral and alphabet of the last digit of MAC address.

- When the numeral/alphabet of the last digit is even number, A, C, or E:
  The MAC address for LAN port 1 is as described on the label.
  The MAC address for LAN port 2 can be obtained by adding 1 to the described MAC address.
- When the numeral/alphabet of the last digit is odd number, B, D, or F:
  The MAC address for LAN port 1 can be obtained by adding 1 to the described MAC address.
  The MAC address for LAN port 2 can be obtained by adding 2 to the described MAC address.

The MAC addresses can be checked from the proper Windows or Linux command.

- Windows
  Enter "ipconfig /all" for the command prompt or from [Run] in the Start menu to see the indicated physical address part.
- Linux
  Enter "ifconfig" for the prompt to see the indicated "Hwaddr".

INSTALLING THE STORAGE AND I/O BLADE

Install the Storage and I/O Blade in the dedicated Blade Enclosure. The slot to install the Storage and I/O Blade must be the one adjacent to the CPU blade to which the Storage and I/O Blade is to be connected. See "Installation Order" described later in this chapter for how to install the Storage and I/O Blade in the slot.

Refer to the User's Guide of Blade Enclosure for how to install the Blade Enclosure.

IMPORTANT: The Storage and I/O Blade is extremely sensitive to static electricity. Make sure to touch the metal frame of the Storage and I/O Blade to discharge static electricity from your body before handling the Storage and I/O Blade. Do not touch the pins, leads, or circuitry and place the Storage and I/O Blade directly on the desk. For static notes, see "Anti-static Measures" in Chapter 9.

Installation Order

Install the Storage and I/O Blade into the slot adjacent to the target CPU blade.

See the description below for installation order.

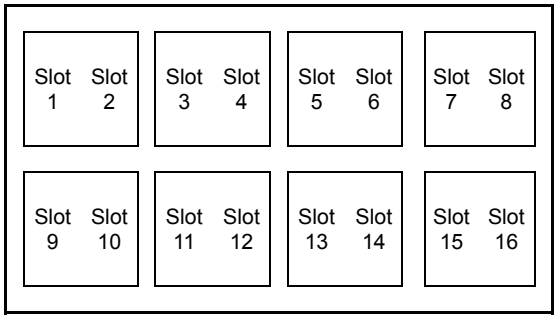
SIGMABLADE-H

- CPU blade that occupies a single slot

  A pair of a CPU blade and a Storage and I/O Blade occupies two slots as shown below.

  Slots 1 and 2, slots 3 and 4, slots 5 and 6, or slots 7 and 8

  Slots 9 and 10, slots 11 and 12, slots 13 and 14, or slots 15 and 16

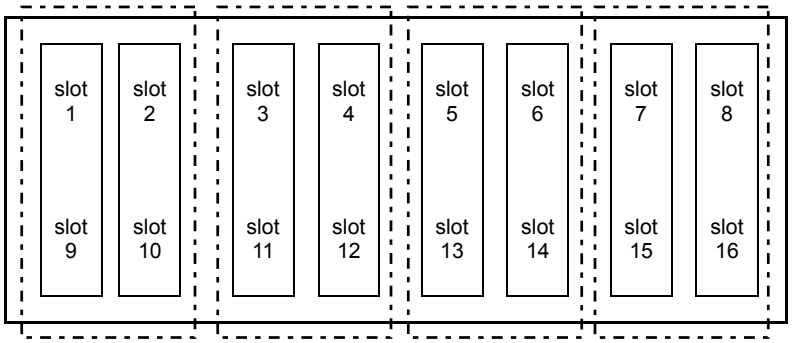


NOTE: A Storage and I/O Blade may be installed in either of the two slots composing a pair.

- CPU blade that occupies two slots (upper and lower)

  A pair of a CPU blade and a Storage and I/O Blade occupies four slots as shown below.

  Slots 1 and 9 – 2 and 10; slots 3 and 11 – 4 and 12; slots 5 and 13 – 6 and 14; slots 7 and 15 – 8 and 16



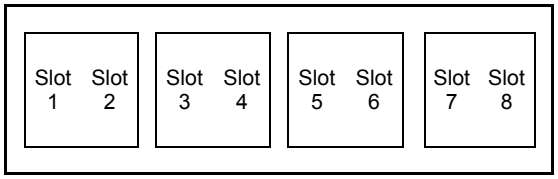
IMPORTANT: To use the Storage and I/O Blade with the CPU blade that uses upper and lower two slots, an optional N8403-032 joint bracket for AD106a is required.

NOTE: A Storage and I/O Blade may be installed in either of the two slots composing a pair.

SIGMABLADE-M

A pair of a CPU blade and a Storage and I/O Blade occupies two slots as shown below.

Slots 1 and 2, slots 3 and 4, slots 5 and 6, or slots 7 and 8



NOTE: A Storage and I/O Blade may be installed in either of the two slots composing a pair.

Installing in Blade Enclosure

To use the Storage and I/O Blade, install it in a Blade Enclosure.

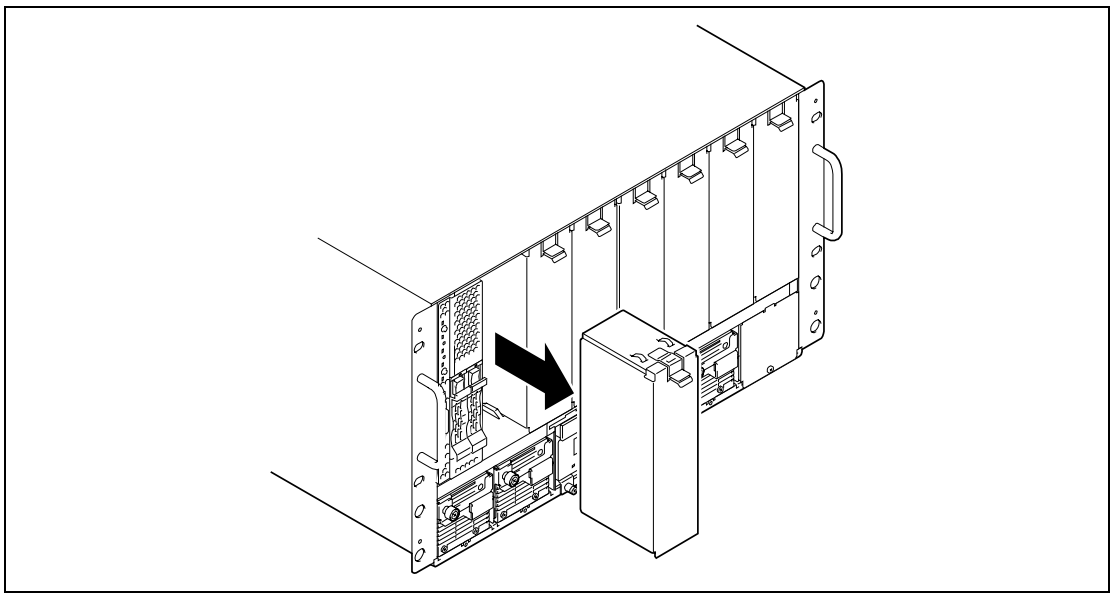
This section describes how to install the Storage and I/O Blade in SIGMABLADE-M, as an example.

Installation

1. Locate a slot to install Storage and I/O Blade according to "Installation Order" described earlier.
2. If the CPU blade has already been installed, power off the CPU blade.

   IMPORTANT: You cannot install/remove Storage and I/O Blade with the power of CPU blade being on.

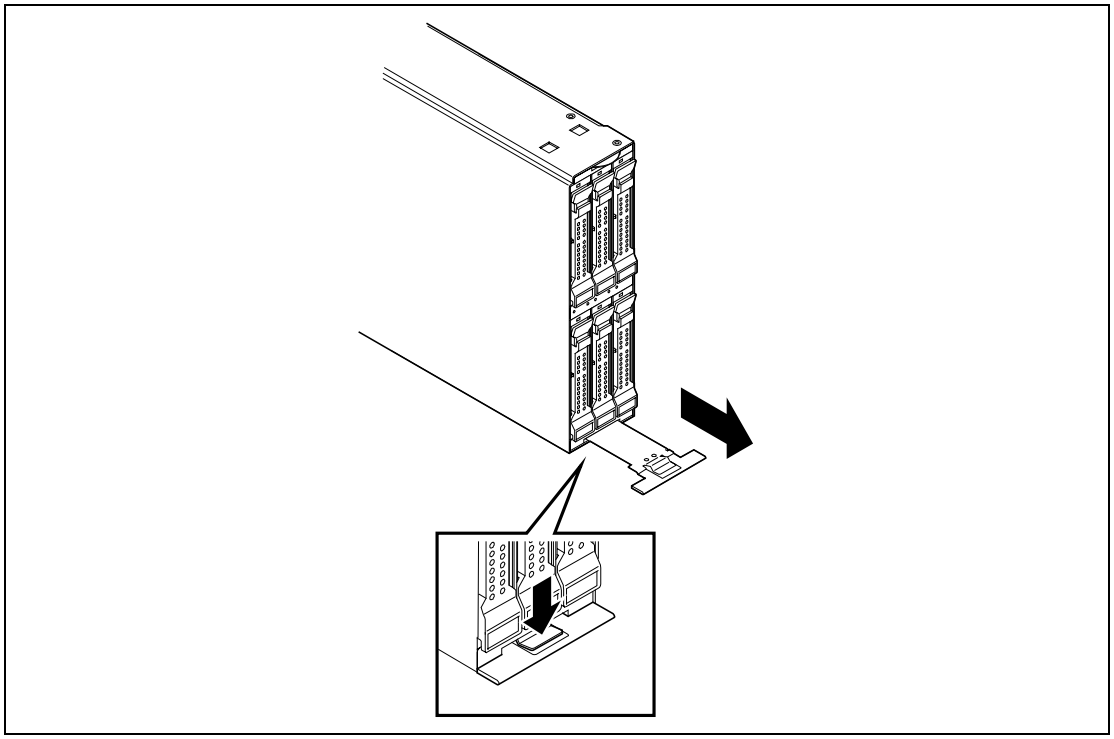
3. If a blank cover is installed on the slot on which the Storage and I/O Blade is to be installed, unlock it by holding the lever on the front face, and remove the blank cover.



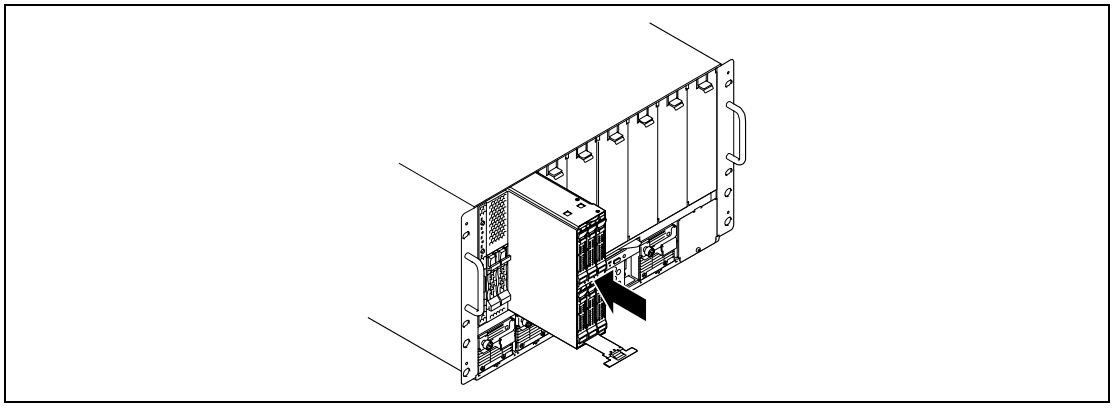
IMPORTANT:

- Keep the removed blank cover for future use.
- Do not remove the blank cover from any other slot than the target slot.

4. While pushing the eject button on the lower part of Storage and I/O Blade, pull the eject lever toward you.



5. Insert the end of Storage and I/O Blade into the guide rails at top and bottom of the Blade Enclosure, then push the Storage and I/O Blade slowly and carefully into the Blade Enclosure.



6. Push the eject lever in the Storage and I/O Blade firmly.

Removal

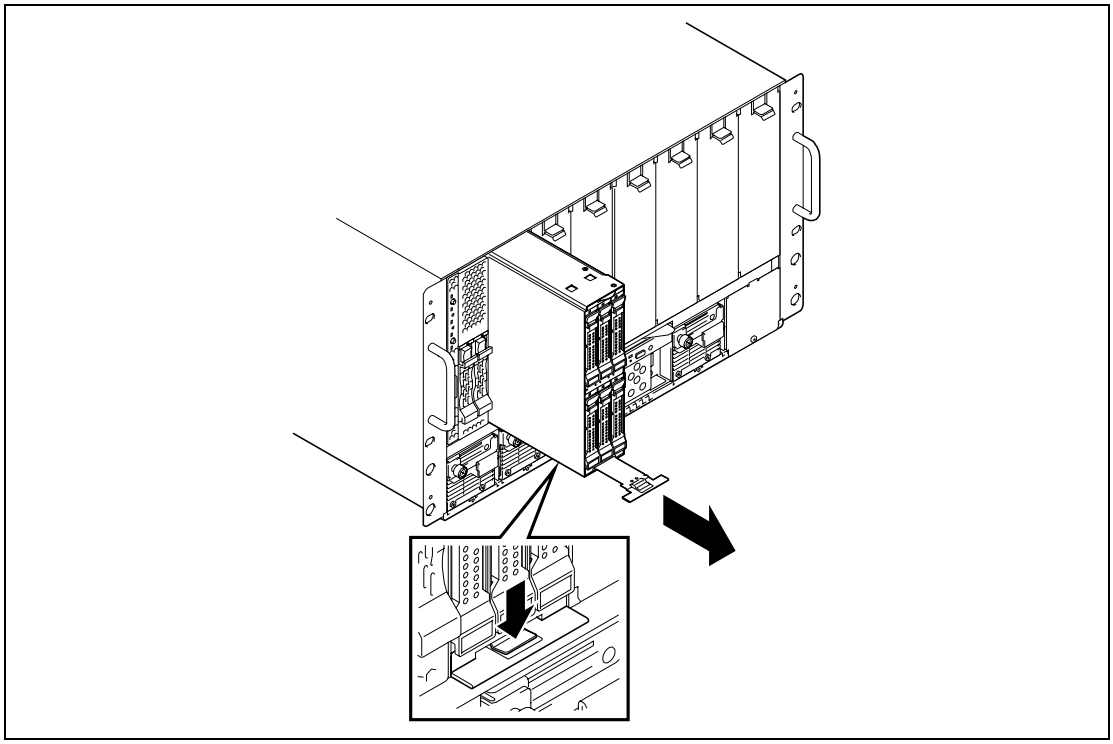
1. Power off the CPU blade to which the Storage and I/O Blade is being connected.

IMPORTANT:

- Be very careful to power off the CPU blade that is connected with the Storage and I/O Blade you are going to remove.
- You cannot install or remove the Storage and I/O Blade while the CPU blade is being powered on.

NOTE: The power of the Storage and I/O Blade is automatically turned off linking with the CPU blade.

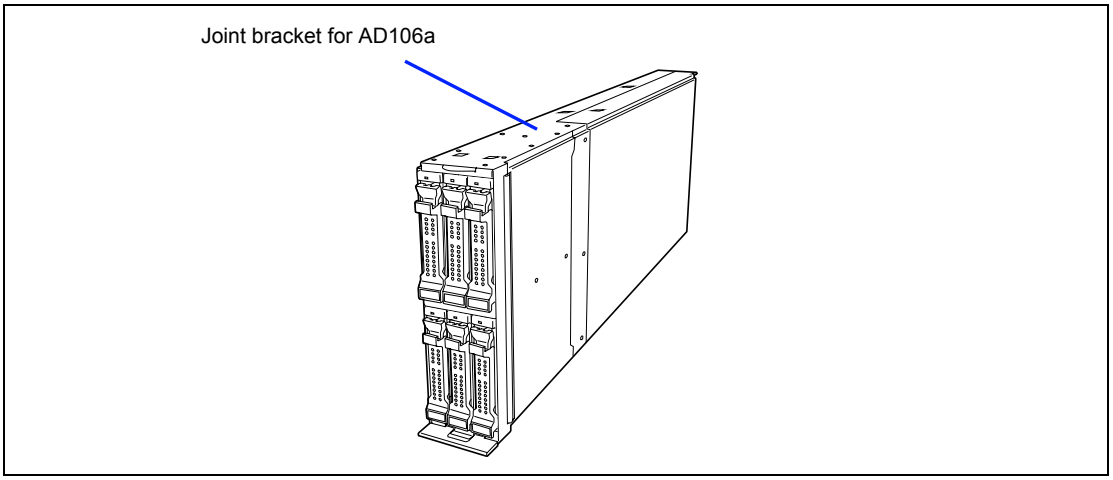
2. While pushing the eject button on the lower part of Storage and I/O Blade, pull the eject lever toward you.



IMPORTANT: Be sure to push the eject lever in the Storage and I/O Blade.

N8403-032 Joint Bracket for AD106a

To use the Storage and I/O Blade with the CPU blade that uses upper and lower two slots, an optional N8403-032 joint bracket for AD106a is required.

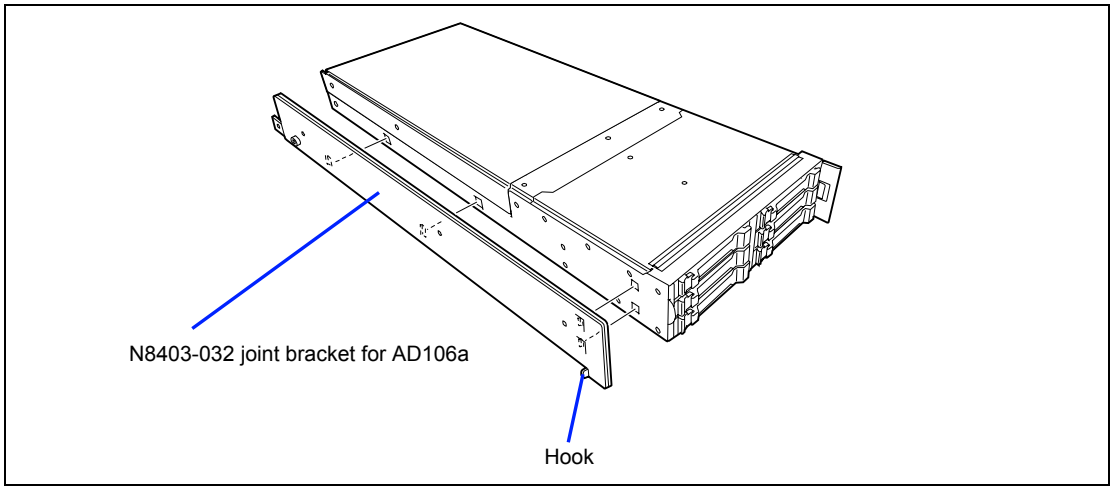


NOTE: N8403-032 joint bracket for AD106a must be installed to the Storage and I/O Blade in the lower stage of SIGMABLADE-H.

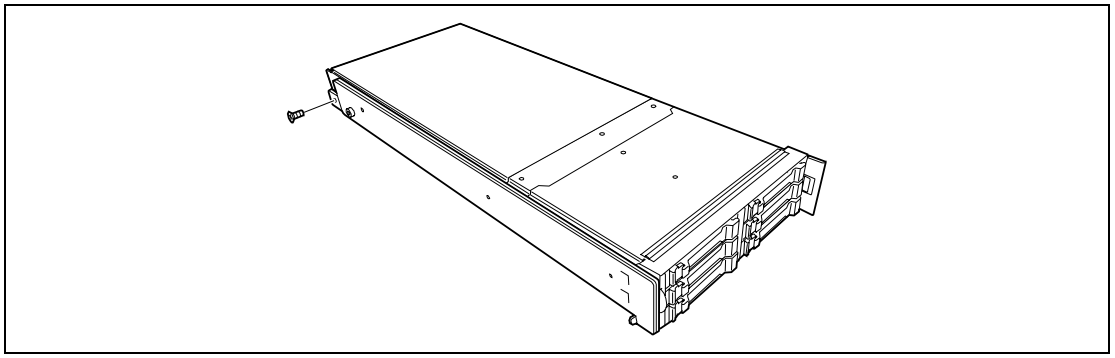
Installation and Removal

1. Put N8403-032 joint bracket for AD106a with its hooks faces the top surface of Storage and I/O Blade.

   Make sure that hooks on N8403-032 joint bracket for AD106a engage with holes on the Storage and I/O Blade.



2. Secure the N8403-032 joint bracket for AD106a together with the Storage and I/O Blade to the rear of the chassis.



3. Remove the N8403-032 joint bracket for AD106a in reverse order of the installation steps.

INSTALLING THE HARD DISK DRIVE

Install a hard disk drive according to the procedure described in Chapter 9.

IMPORTANT:

- The hard disk drive is extremely sensitive to static electricity. Make sure to touch the metal frame of the Storage and I/O Blade to discharge static electricity from your body before handling the hard disk drive. Do not touch the pins, leads, or circuitry and place the hard disk drive directly on the desk. For static notes, see "Anti-static Measures" in Chapter 9.
- Some hard disk drive may contain operating system. Strict care must be taken when handling it.
- Handle the hard disk drive carefully so that the hard disk drive may not be given excess shocks and vibrations.

Chapter 4

Configuring Your Storage and I/O Blade

This chapter describes how to configure RAID system with hard disk drives installed in the Storage and I/O Blade.

RAID SYSTEM CONFIGURATION

This section describes how to use the internal hard disk drives as RAID System by Internal RAID Controller.

RAID

Overview of RAID System

What is RAID (Redundant Array of Inexpensive Disks)?

RAID can configure more than one HDDs as a single array (disk group) to operate the HDDs effectively. This can bring higher performance than a single HDD of a large capacity.

The Internal RAID Controller has a feature to divide a single disk group into several logical drives (virtual disks). Operating system recognizes these virtual disks as if it were a single hard disk drive. Operating system accesses to more than one hard disk drive configuring a disk group in parallel.

Some RAID levels can recover data from remaining data and parity by using rebuild feature if an error occurs in a single HDD. This can provide high reliability for the system.

RAID Levels

The record mode enabling the RAID feature includes several levels. Among the levels, the Internal RAID Controller supports RAID levels 0, 1, 5, and 6. The number of hard disk drives required to create a disk group varies depending on the RAID level as shown in the table below.

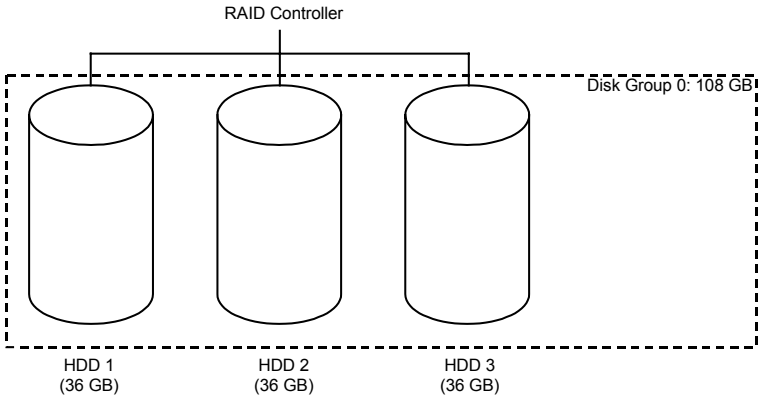
RAID level	Number of required HDDs	
	Min.	Max.
RAID 0	1	6
RAID 1	2	2
RAID 5	3	6
RAID 6	3	6

NOTE: For details of the RAID levels, see "RAID Levels" described later in this chapter.

Disk Group

A disk group is configured with more than one HDDs.
The allowable number of disk groups is equal to the number of HDDs.

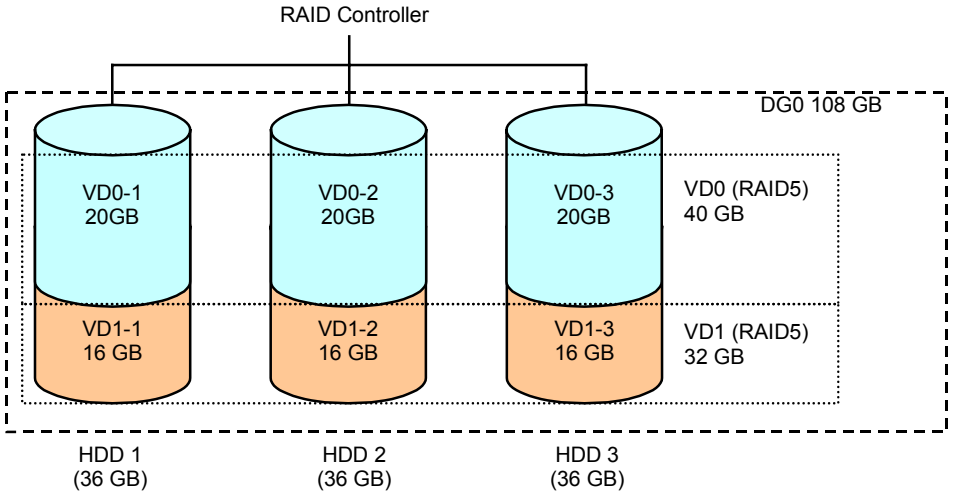
The figure below shows a sample configuration. The three HDDs are connected to the Internal RAID Controller, creating one disk group (DG).



Virtual Disk

Virtual disk is a logical drive defined in disk group. It is recognized as a physical drive by OS. The allowable number of virtual disks is up to 16 per disk group, or up to 64 per controller.

The figure below shows a sample configuration in which the Internal RAID Controller is connected with three HDDs, creating one Disk Group. Two RAID5 virtual disks (VD) are defined in the Disk Group.



Parity

The parity means redundant data. A single set of redundant data is created from the data saved in more than one HDD.

The created redundant data is used for data recovery when a HDD is defected.

Hot-Swap

The hot-swap enables a HDD to be removed (or replaced) under system operation.

Hot-Spare

The hot-spare is prepared as an auxiliary HDD substituting for a defected HDD included in a logical drive which is configured at a redundant RAID level. Detecting a HDD fault, the system disconnects the HDD (or makes it offline) and starts rebuild using the hot-spare.

RAID Levels

Characteristics of RAID Levels

The table below lists the characteristics of the RAID levels.

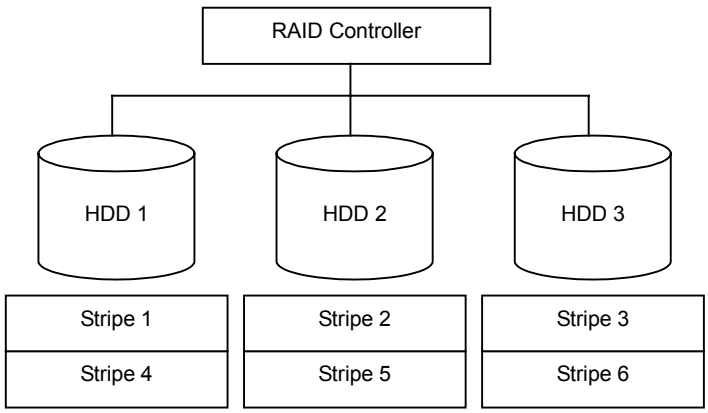
Level	Function	Redundancy	Characteristics
RAID0	Striping	No	• Data read/write at the highest rate • Largest capacity • Capacity: (capacity of single HDD) × (number of HDDs)
RAID1	Mirroring	Yes	• Two HDDs required • Capacity: capacity of single HDD
RAID5	Striping of both data and redundant data	Yes	• Three or more HDDs required • Capacity: (capacity of single HDD) × ((number of HDDs) - 1)
RAID6	Striping of both data and redundant data	Yes	• Three or more HDDs required • Capacity: (capacity of single HDD) × ((number of HDDs) - 2)

RAID0

In RAID0, data to be recorded is distributed to HDDs. The mode is called "striping".

In the figure below, data is recorded in stripe 1 (disk 1), stripe 2 (disk 2), and stripe 3 (disk 3)… in the order. Because RAID0 allows all HDDs to be accessed collectively, it can provide the best disk access performance.

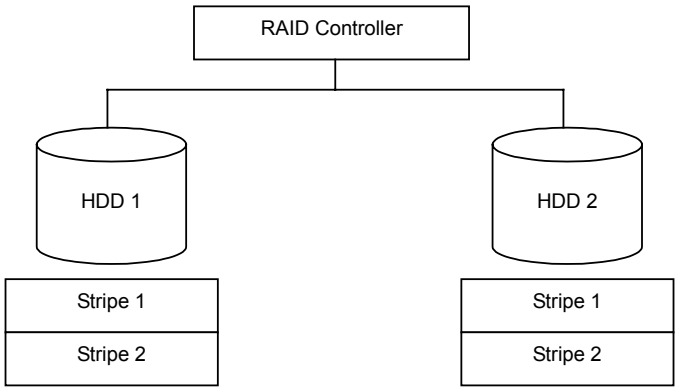
IMPORTANT: RAID0 cannot have data redundancy. If a HDD is defected, the data saved in the HDD cannot be recovered.



RAID1

In the RAID1 level, data saved in a HDD is written to another HDD without change. The mode is called "mirroring".

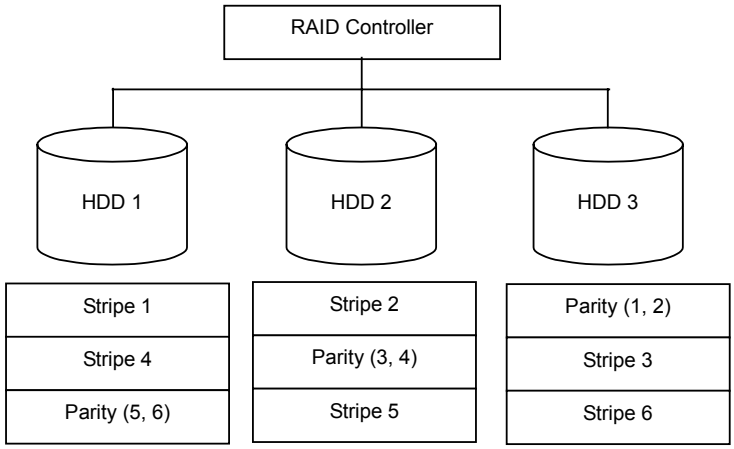
When data is written onto a single HDD, the same data is written onto another HDD. If either of the HDDs is defected, the other HDD containing the same data can substitute for the defected HDD. Thus the system can continue to operate without interruption.



RAID5

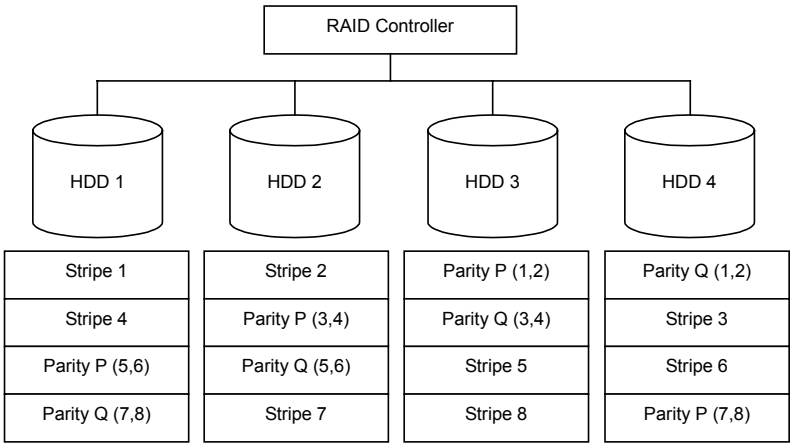
In RAID5, data is distributed to HDDs by striping and, at the same time, the parity (redundant data) is distributed to the HDDs. This mode is called "striping with distributed parity".

Each of stripe x, stripe x+1, and parity (x, x+1) created from stripe x and stripe x+1 is written onto a specific HDD. Accordingly, the total capacity assigned to the parity is just the same as the capacity of a single HDD. If any one of the HDDs configuring a logical drive is defected, data is still available with no problems.



RAID6

A RAID 6 extends RAID 5 by adding an additional parity block (Q) created by different calculation method such as weighting by some factor, thus it uses block-level striping with two parity blocks distributed across all member disks. This mode is called "striping with duplex and distributed parity". Accordingly, the total capacity assigned to the parity is just the same as the capacity of two HDDs. If any two of the HDDs configuring a logical drive are defected, data is still available with no problems.



Configuration by Internal RAID Controller

This section describes how to use the internal hard disk drives as RAID System by Internal RAID Controller.

Features of Internal RAID Controller

Rebuild

If a HDD is defected, the rebuild feature can recover the data in the defected HDD. The rebuild can be applied to redundant virtual disks in the RAID1, RAID5, or RAID6 level.

Manual Rebuild

The manual rebuild can be performed by using WebBIOS or Universal RAID Utility, the management utility of the Internal RAID Controller. Select a HDD and start the rebuild manually.

For the detailed operation, refer to the "Universal RAID Utility Ver2.0 User's Guide" in NEC EXPRESSBUILDER DVD that comes with the CPU blade.

Auto Rebuild

The Internal RAID Controller can automatically start the rebuild without use of any utility such as Universal RAID Utility.

The auto rebuild includes two types as follows:

- Standby rebuild

  Automatic rebuild by using hot-spares. In the configuration including hot-spares, the rebuild is performed automatically if a HDD assigned to a virtual disk is defected.

- Hot-swap rebuild

  Automatic rebuild by hot-swapping defected HDD.

IMPORTANT: Note the following for the rebuild:

- The HDD used for rebuild should have the same capacity, rotation speed, and standard as the defected HDD.
- During rebuild, the processing rate is decreased due to much load.
- During rebuild, do not shutdown or reboot the CPU blade connected with this Storage and I/O Blade. If the CPU blade is shutdown by an unforeseen accident such as power interruption, turn on the power again as soon as possible. The rebuild is automatically restarted.
- The interval from the removal of the defected HDD to the installation of a substitute HDD should be 60 seconds or longer.
- If the hot-swap rebuild does not operate, perform the manual rebuild.

Patrol Read

The patrol read gives the read & verify test in the entire area of HDDs. It can be performed for all HDDs assigned to virtual disks and hot-spares.

The Patrol Read allows subsequent defects of HDDs to be detected and repaired.

For HDDs configuring redundant virtual disks or those assigned to hot-spares, error sectors detected during Patrol Read can be repaired.

IMPORTANT: Note the following for the patrol read:

- For the Internal RAID Controller, Patrol Read feature is factory-set to "Enabled".
- To change settings of Patrol Read, use Universal RAID Utility.
- If the system is restarted while running Patrol Read, Patrol Read resumes from that point.

Consistency Check

The Consistency Check is used to check consistency among virtual drives. It is available for redundant virtual drives except for RAID0. It is also available for host spare.

Consistency Check can be performed through WebBIOS or Universal RAID Utility.

Consistency Check performs not only consistency check but also repair of error sectors. Accordingly, it can be used as preventive maintenance.

IMPORTANT: Note the following for Consistency Check:

- During Consistency Check, the processing rate is decreased due to much load.
- If the system is restarted, the Consistency Check is aborted. However, the Consistency Check resumes after restart.
- To schedule execution of Consistency Check, use WebBIOS.

Background Initialize

The Background Initialize is automatically executed when RAID5 virtual disk is created in the disk group composing of five or more HDDs.

The Background Initialize performs the parity generation processing in the background to the area not initialized. The processing is equivalent to that of Consistency Check.

However, the Background Initialize is not performed in the following cases.

- Full Initialize has already been executed and completed normally before executing Background Initialize.

  (*) Full Initialize is a function to clear the entire area of a virtual disk with "0".
- Consistency Check has already been executed and completed normally before executing Background Initialize.
- Rebuild has already been executed and completed normally before executing Background Initialize (for RAID5 only).
- "Yes" is specified for "Disable BGI" in VD Definition.
- Virtual disk is in degraded or offline state.
  Background Initialize is performed if the virtual disk of RAID6 is partially degraded.

The Background Initialize is executed again if any of the following cases occurred in the virtual disk on which the Background Initialize has completed.

- When the virtual disk is degraded or offline, you execute Make Online to HDD being in offline status, and the virtual disk becomes Optimal state.
- When you replace the RAID Controller with the maintenance parts and others.
- When you execute Reconstruction to existing virtual disk to make RAID5 VD with five or more HDDs.

IMPORTANT: Note the following for Background Initialize:

- During Background Initialize, the processing rate is decreased due to much load.
- Background Initialize will resume a few minutes later even if it is interrupted.

Reconstruction

The reconstruction feature is used to change configuration and/or RAID level of existing virtual disk. The Reconstruction contains the following three features, however, the Internal RAID Controller supports "Migration with addition" only.

> **IMPORTANT:** You can use WebBIOS for Reconstruction. Universal RAID Utility does not support Reconstruction.

- Removed physical drive

  Unsupported.

- Migration only

  Unsupported.

- Migration with addition

  Use this feature to add HDDs to existing virtual disk. The execution patterns are as shown below (α: Number of HDDs to be added).

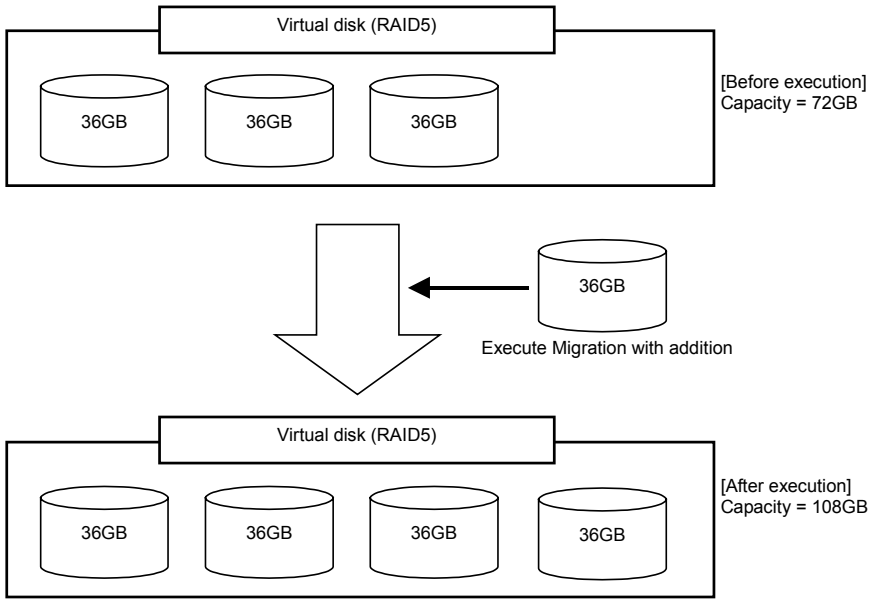
Before execution		After execution		Description
RAID level	Number of HDDs	RAID level	Number of HDDs	
RAID0	x	RAID0	x+α	Capacity increased: equivalent to α HDDs
RAID0	1	RAID1	2	Capacity remains unchanged.
RAID0	x	RAID5	x+α	Capacity increased: equivalent to α-1 HDDs
RAID0	x	RAID6	x+α (α=2 or more)	Capacity increased: equivalent to α-2 HDDs
RAID1	2	RAID0	2+α	Capacity increased: equivalent to α+1 HDDs
RAID1	2	RAID5	2+α	Capacity increased: equivalent to α HDDs
RAID1	2	RAID6	2+α	Capacity increased: equivalent to α-1 HDDs
RAID5	x	RAID0	x+α	Capacity increased: equivalent to α+1 HDDs
RAID5	x	RAID5	x+α	Capacity increased: equivalent to α HDDs
RAID5	x	RAID6	x+α	Capacity increased: equivalent to α-1 HDDs
RAID6	x	RAID0	x+α	Capacity increased: equivalent to α+2 HDDs
RAID6	x	RAID5	x+α	Capacity increased: equivalent to α+1 HDDs
RAID6	x	RAID6	x+α	Capacity increased: equivalent to α HDDs

IMPORTANT: Note the following for the Reconstruction:

- Be sure to make backup copy of data and perform Consistency Check before starting Reconstruction.
- The Reconstruction is disabled in the configuration where several virtual disks are defined in one disk group
- During Reconstruction, the processing rate is decreased due to much load.
- The Reconstruction can be performed for the degraded or partially degraded virtual disk. However, it is recommended to execute Rebuild to recover the virtual disk, then execute Reconstruction.
- During Reconstruction, do not shutdown or reboot the CPU blade connected with this Storage and I/O Blade. If the CPU blade is shutdown by an unforeseen accident such as power interruption, turn on the power again as soon as possible. The Reconstruction is automatically restarted.
- In some configuration, Background Initialize may start automatically upon completion of Reconstruction.

Ex: Migration with addition for RAID5 virtual disk

The figure below shows an example of adding a single 36GB HDD to a RAID5 virtual disk configured with three 36GB HDDs.



Configuration on Disk (COD) Feature

Configuration on Disk (COD) feature is used to store the configuration information in hard disk drive.

If the RAID controller is replaced with new one due to its failure, you can restore the configuration information from the hard disk drive. Then, the RAID system can work normally.

> **NOTE:** The Internal RAID Controller does not have the configuration information. All the configuration information is stored in hard disk drive.

Before Using WebBIOS

Read the following sections describing supported functions and precautions before using "WebBIOS".

Supported Functions

- Indication of model name and capacity of Hard Disk Drive
- Indication of allocation status of Hard Disk Drive
- Creation of virtual drive
  - Setting of RAID level
  - Setting of Stripe Block size
  - Setting of Read Policy/Write Policy/IO Policy
- Indication of configuration information and status of virtual drive
- Removal of virtual drive
- Clearing of configuration
- Execution of initialization
- Execution of Consistency Check
- Execution of manual rebuild
- Execution of reconstruction

Notes on Creating Virtual Drive

1. The Hard Disk Drives configuring the drive group should have the same capacity and rotation speed.
2. Be sure to execute Consistency Check after creating VD.
3. When installing an OS in VD under the Internal RAID Controller, create a VD dedicated to OS installation.
4. WebBIOS cannot be used via remote console functions of NEC ESMPRO Manager.
5. The physical drive numbers shown in WebBIOS and those shown in Universal RAID Utility are identified as follows.

   – WebBIOS

   Slot number shown in Physical View *1

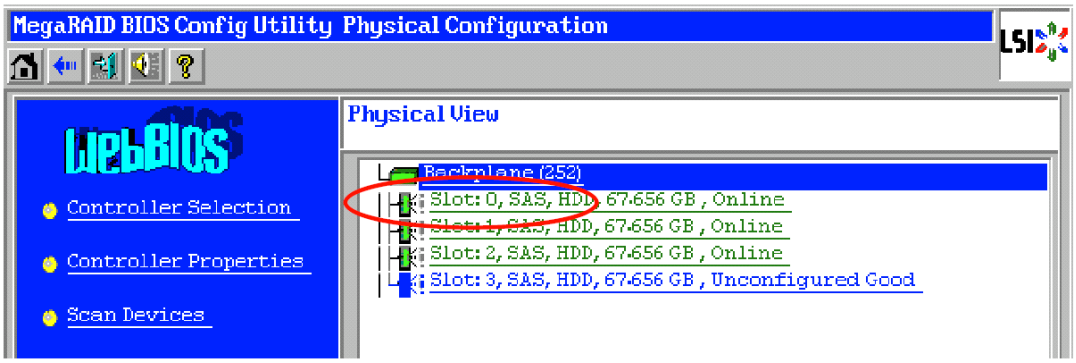
   *1: The slot number, type of Hard Disk Drive, its capacity, and its current status are shown in Physical View.

   The slot number is indicated by the number 0 to 5. It represents the slot number in the Hard Disk Drive bay.

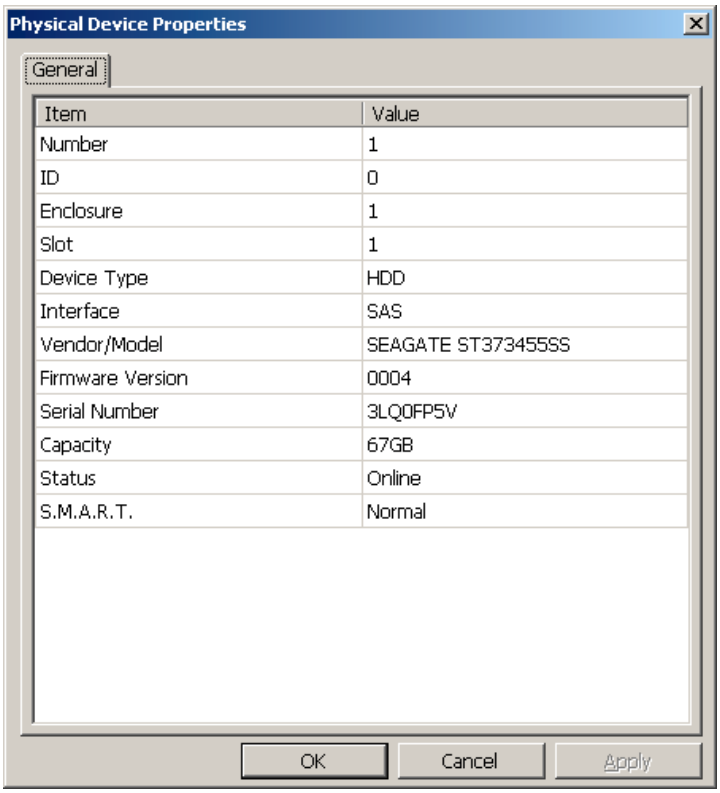
   – Universal RAID Utility

   ID shown in Physical Device Properties

   The slot number shown on WebBIOS corresponds to the physical device ID shown on Universal RAID Utility. For more information, refer to the Universal RAID Utility Ver2.0 User's Guide.


MegaRAID BIOS Config Utility Physical Configuration
LSI
WebBIOS
Controller Selection
Controller Properties
Scan Devices
Physical View
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB , Online
Slot: 1, SAS, HDD, 67.656 GB , Online
Slot: 2, SAS, HDD, 67.656 GB , Online
Slot: 3, SAS, HDD, 67.656 GB , Unconfigured Good

Physical View of WebBIOS

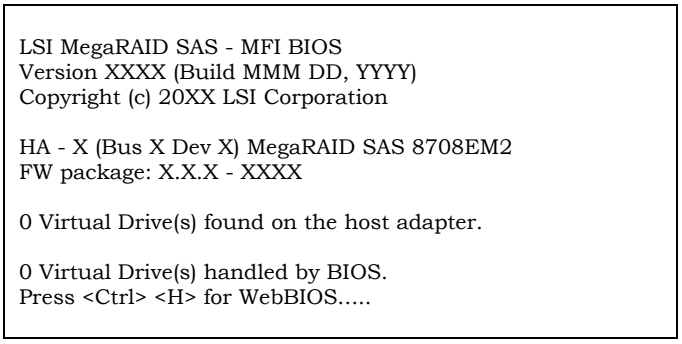


Property of Physical Device of Universal RAID Utility

Using WebBIOS

Starting WebBIOS

1. When the screen as shown below appears, press **Ctrl** + **H** to start WebBIOS.


LSI MegaRAID SAS - MFI BIOS
Version XXXX (Build MMM DD, YYYY)
Copyright (c) 20XX LSI Corporation
HA - X (Bus X Dev X) MegaRAID SAS 8708EM2
FW package: X.X.X - XXXX
0 Virtual Drive(s) found on the host adapter.
0 Virtual Drive(s) handled by BIOS.
Press <Ctrl> <H> for WebBIOS.....

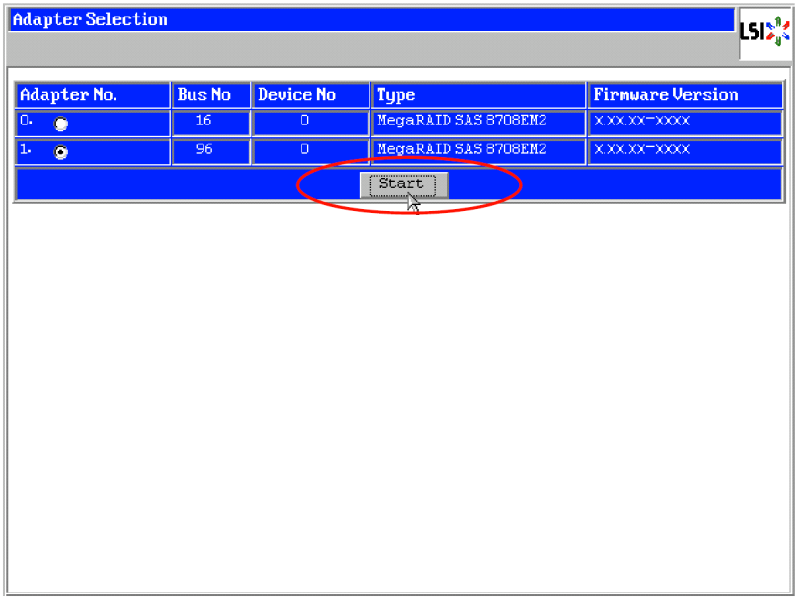
POST screen image (with no virtual drive assigned)

IMPORTANT:

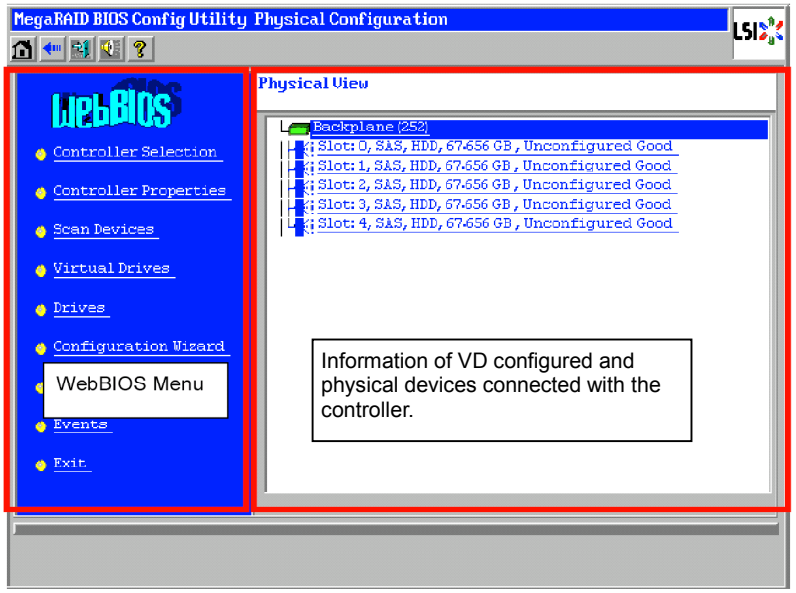
- Do not press unnecessary key such as **Pause** during POST.
- If you fail to press **Ctrl** + **H** or the system proceeds without displaying the WebBIOS main menu (shown on the next page), reboot the CPU blade connected with this Storage and I/O Blade, and press **Ctrl** + **H** on POST screen.

Main Menu

Shown below is [Adapter Selection] screen that appears first on WebBIOS. On [Adapter No.] box, select an adapter you want to operate with WebBIOS, then click [Start].



When the adapter is selected on [Adapter Selection], the WebBIOS Top Menu appears.


MegaRAID BIOS Config Utility Physical Configuration
WebBIOS
Controller Selection
Controller Properties
Scan Devices
Virtual Drives
Drives
Configuration Wizard
Events
Exit
Physical View
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB , Unconfigured Good
Slot: 1, SAS, HDD, 67.656 GB , Unconfigured Good
Slot: 2, SAS, HDD, 67.656 GB , Unconfigured Good
Slot: 3, SAS, HDD, 67.656 GB , Unconfigured Good
Slot: 4, SAS, HDD, 67.656 GB , Unconfigured Good
WebBIOS Menu
Information of VD configured and physical devices connected with the controller.

WebBIOS Menu

Controller Selection	Goes back to Adapter Selection menu.
Controller Properties	Displays properties of the controller.
Scan Devices	Detects Hard Disk Drives connected with the controller again.
Virtual Drives	Opens operation window for VD that has already been configured.
Drives	Opens operation window for Hard Disk Drive connected with the controller.
Configuration Wizard	Displays the wizard to configure VD.
Physical View / Logical View	Switches indication between Hard Disk Drives and VD configuration.
Events	Displays event data.
Exit	Goes to Exit menu of WebBIOS.

Status Indication of Virtual Drive (not shown on Physical View)

Optimal	Indicates that the VD is in normal state. The indication is green.
Partially Degraded	Indicates that one of the Hard Disk Drives in the relevant VD is degraded in RAID6 configuration. The indication is blue.
Degraded	Indicates that one or two of the Hard Disk Drives in the relevant VD is degraded in RAID6 configuration. The indication is blue.
Offline	The relevant VD is in offline state. The indication is red.
Initialization	The relevant VD is being initialized.
ConsistencyCheck	Consistency Check is being performed to the relevant VD.
Rebuild	The relevant VD is being rebuilt.
BackGroundInitialize	The relevant VD is being initialized in background.
Reconstruction	The relevant VD is being reconstructed.

Status Indication of Hard Disk Drive

Unconfigured Good	The Hard Disk Drive connected with the controller is not in use. The indication is blue.
Online	Indicates that the Hard Disk Drive in configuration is in normal state. The indication is green.
Offline	Indicates that the Hard Disk Drive in configuration is in offline state. The indication is red.
Unconfigured Bad	The relevant Hard Disk Drive is faulty. (The Hard Disk Drive in this status can be checked only on Physical View.) The indication is black.
Rebuild	The relevant Hard Disk Drive is being rebuilt. The indication is yellow.
Hotspare	Indicates the Hard Disk Drive that is assigned to hot-spare. The indication is pink.

IMPORTANT:

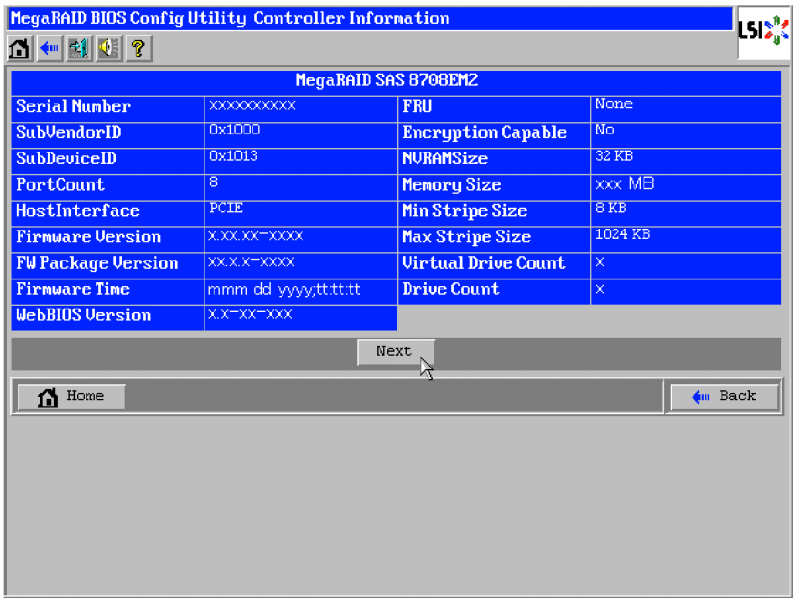
- The right frame of Physical View shows slot number, type, capacity, and status of Hard Disk Drive.
- The slot number is represented by the number between 0 and 5. It indicates the slot number of the Hard Disk Drive bay.
- The controller does not support the Events feature.

NOTE: S.M.A.R.T status

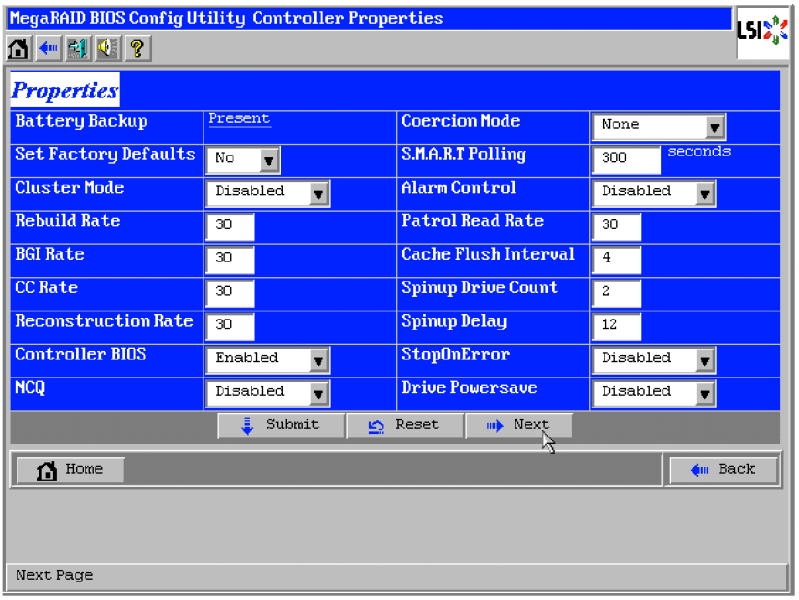
- The information of the Hard Disk Drive that has one or more Pred Fail Count is displayed in yellow.
- Indicates that the device has failed in the past. You can use the device as usual, however, we recommend you to replace it with new one.

Controller Properties

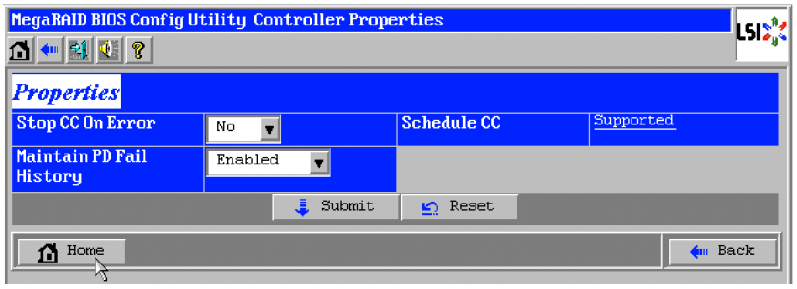
When you click [Controller Properties] on WebBIOS Top Menu, the configuration information is displayed.



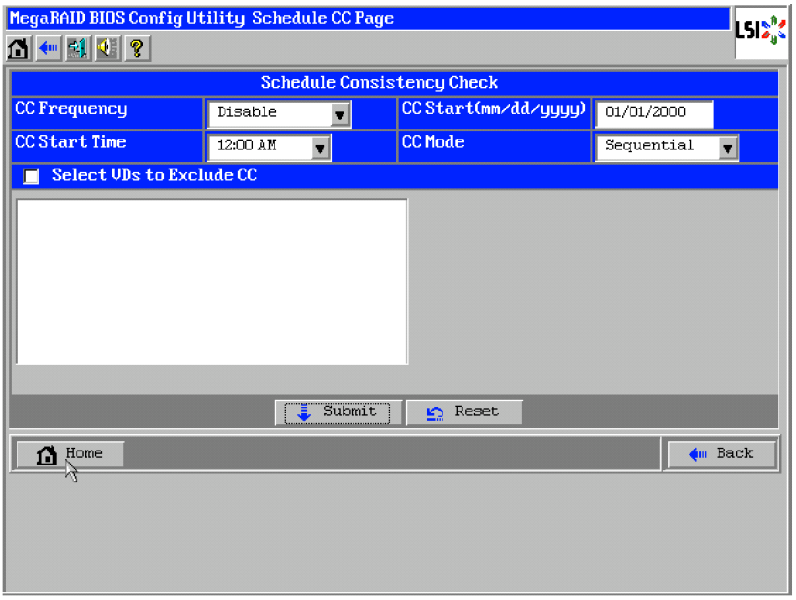
Click [Next] to see the detailed settings of this controller.



The detailed setting is continued on the next page. Click [Next] to view more information.



Clicking [Supported] in "Schedule CC" opens the screen for setting scheduled consistency check.



Default settings and their explanation

Item	Default	Description	Change
Battery Backup	Present None	Displays Properties of additional battery. • When battery is installed: Present • When battery is not installed: None	–
Set Factory Defaults	No	–	Prohibited [*1]
Cluster Mode	Disabled	–	Prohibited
Rebuild Rate	30	Recommended value: 30	Permitted
BGI Rate	30	Recommended value: 30	Permitted
CC Rate	30	Recommended value: 30	Permitted
Reconstruction Rate	30	Recommended value: 30	Permitted
Controller BIOS	Enabled	–	Prohibited
NCQ	Disabled	–	Prohibited
Coercion Mode	None	–	Prohibited
S.M.A.R.T Polling	300	–	Prohibited
Alarm Control	Disabled	Disabled: Does not issue an alarm. Enabled: Issues an alarm. Silence: Stops an alarm if beeped.	Permitted [*2]
Patrol Read Rate	30	Recommended value: 30	Permitted
Cache Flush Interval	4	–	Prohibited
Spinup Drive Count	2	–	Prohibited
Spinup Delay	12	–	Prohibited
StopOnError	Disabled	–	Prohibited
Drive Powersave	Disabled	–	Prohibited
Stop CC On Error	No Yes	Specify the operation at error detection in Consistency Check. No: Recover and resume. Yes: Abort	Permitted
Maintain PD Fail History	Enabled	–	Prohibited
Schedule CC	Supported	Set the scheduled consistency check.	Permitted
CC Frequency	Disabled	Set the interval of scheduled consistency check. [*3] Disabled: Disables the scheduled consistency check. Continuous: Checks consistency continuously. Hourly: Checks consistency every hour. Daily: Checks consistency every day. Weekly: Checks consistency every week (recommended value). Monthly: Checks consistency every month (recommended value).	Permitted
CC Start Time	12:00 AM	Set the time to start the first consistency check.	Permitted

Item	Default	Description	Change
Select VDs to Exclude CC	Unchecked	Specify the VD to which the scheduled consistency check is not performed. Checked: Consistency check is not performed on the selected VD. Unchecked: Consistency check is performed on every VD.	Permitted
CC Start (mm/dd/yyyy)	01/01/2000	Set the date to start the first consistency check.	Permitted
CC Mode	Sequential	Sequential: Consistency check is performed on several VDs sequentially. Concurrent: Consistency check is performed on several VDs simultaneously.	Permitted

*1 Do not perform "Set Factory Defaults". If performed, the NEC's factory-set value will no longer be restored.

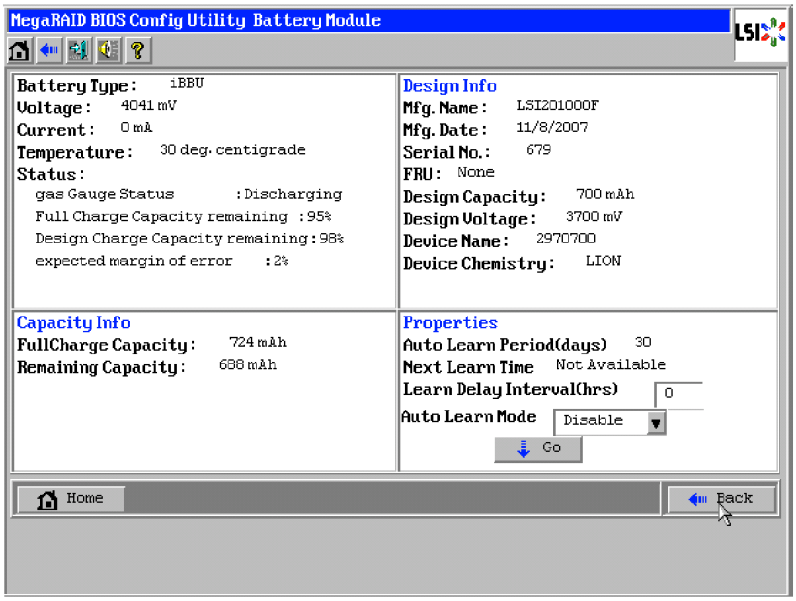
*2 If Alarm Control is set to "Enabled", the CPU blade issues an alarm sound when the VD is degraded due to failure of Hard Disk Drive.

*3 Set interval of scheduled consistency check in "CC Frequency" with sufficient allowance because it is based on "CC Start Time".

How to change setting value

On [Controller Properties] screen, change a parameter to desired value, and then click [Submit] at the center of the screen to determine the new value.

With Storage and I/O Blade, the status of "Battery Backup" is indicated as "Present". Clicking [Present] opens the Battery Status screen as shown below.



IMPORTANT: You cannot change values for "Auto Learn Period", "Next Learn Time", and "Learn Delay Interval".

NOTES:

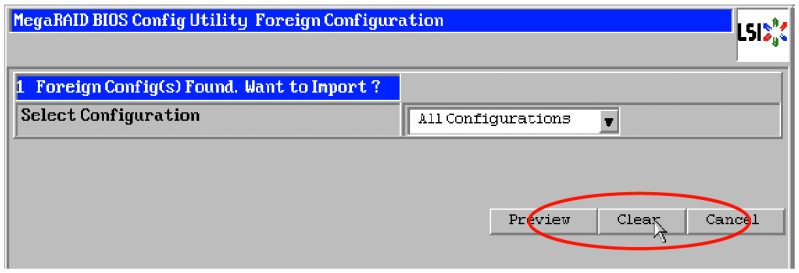
- The value shown in "Current" field indicates battery status.
  – Positive value: Battery is being charged
  – Negative value: Battery is being discharged.
- WebBIOS does not refresh the indication on window. To view the indication, change window (e.g., go back to Top Menu), then check status again.

Scan Devices

When you click [Scan Devices] on WebBIOS Top Menu, the connected Hard Disk Drives are detected again. Use this feature when you have installed a new Hard Disk Drive additionally while the WebBIOS is running.

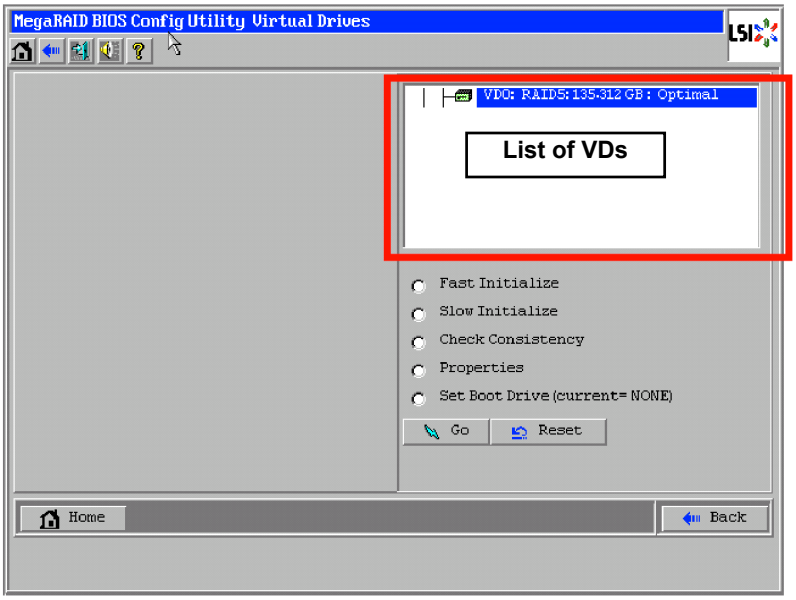
IMPORTANT:

- If the newly connected Hard Disk Drive contains another configuration information, [Foreign Configuration] screen as shown below appears. To use the Hard Disk Drive as new one, click [Clear] to clear the configuration information in Hard Disk Drive.
- If you want to create a logical drive by using the Universal RAID Utility with the newly connected Hard Disk Drive containing another configuration information, first clear another configuration information using this Scan Devices feature.
  (*) Universal RAID Utility does not have this feature.



Virtual Drives

When you click [Virtual Drives] on WebBIOS Top Menu, the screen for operating the VD that has already been configured. List of VDs box shows existing VDs.



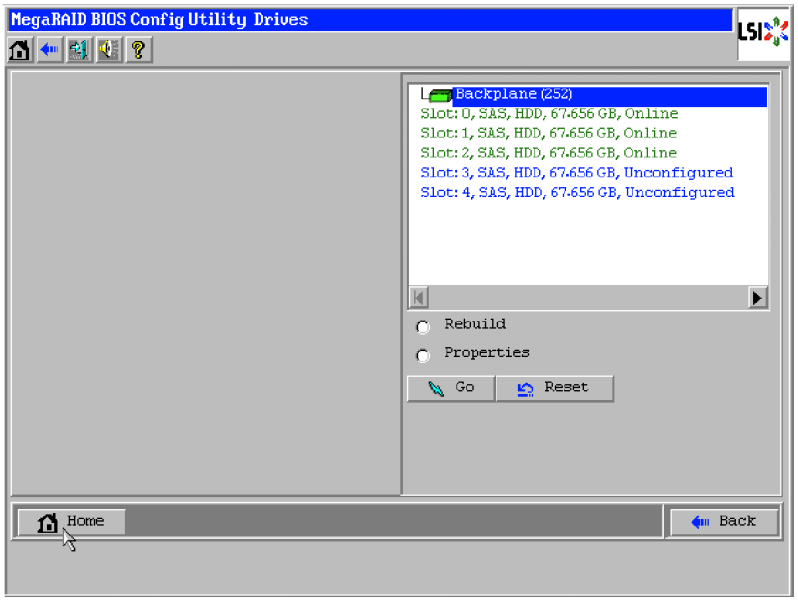
Fast Initialize	Clears the top area of the VD being selected in List of VDs box.
Slow Initialize	Clears whole area of the VD being selected in List of VDs box.
Check Consistency	Checks consistency in the whole area of the VD being selected in List of VDs box. If inconsistency is found, correct it.
Properties	Displays the properties of the VD being selected in List of VDs box.
Set Boot Drive (Current =XX) Default: NONE	Selects a VD to start operating system. If the system contains several VDs and you want to start the operating system from the VD other than VD0, you need to specify the boot drive manually as shown below. Use the default setting in any other cases. [Setting procedure] 1. Select a VD you want to start operating system from the List of VDs box. 2. Put a checkmark on "Set Boot Drive (Current =XX)". 3. Click [Go].

IMPORTANT:

- If no virtual drive exists, the List of VDs box will be blank. Use this menu only when a virtual drive exists.
- Even the "Set Boot Drive" is properly specified, the operating system may fail to start due to Boot Priority specified in BIOS SETUP of the CPU blade connected with this Storage and I/O Blade.
- Inconsistency may be detected at the first Check Consistency performed after the VD was configured.

Drives

When you click [Drives] on WebBIOS Top Menu, the screen for operating the connected physical drive appears.

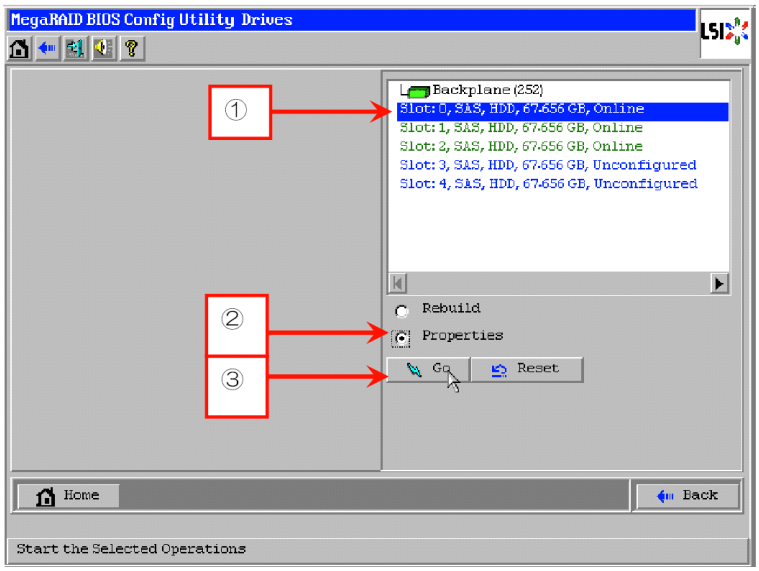


IMPORTANT: If no device is connected, the upper right column of the screen will be blank. Use this menu only when a Hard Disk Drive is being connected.

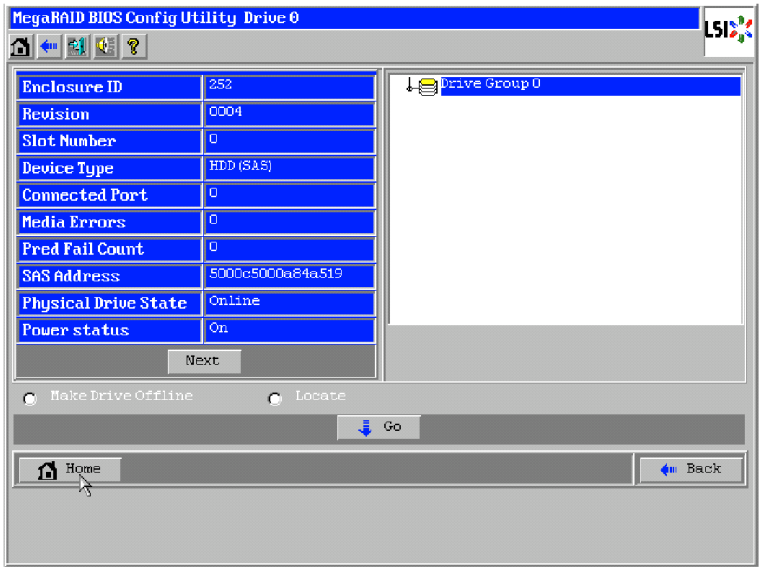
Physical Drive Properties

Take the following procedures to check Physical Drive Properties. Shown below is an example to check property of physical drive.

1. Click the Physical Drive you want to check.
2. Click the checkbox for [Properties].
3. Click [Go].



The Properties screen as shown below appears.



Physical Drive Properties

Item	Description
Locate	Let Disk Status lamp light or blinks.
Make Global HSP	The selected Hard Disk Drive is assigned as hot-spare available for all DGs.
Make Dedicated HSP	The selected Hard Disk Drive is assigned as hot-spare available only for the specific DG.
Remove HOTSPARE	The selected Hard Disk Drive is unassigned from hot-spare and made Unconfigured Good state.
Make Unconf Bad	Make the selected Hard Disk Drive in faulty state. This is indicated on the Hard Disk Drive of which status is "Unconfigured Good".
Make Unconf Good	Make the selected Hard Disk Drive in "Unconfigured Good" state. This is indicated on the Hard Disk Drive of which status is "Unconfigured Bad".
Prepare Removal	Make the power status of the selected Hard Disk Drive in "Powersave" state. This is indicated on the Hard Disk Drive of which power status is "On" and the status is "Unconfigured Good".
Undo Removal	Make the power status of the selected Hard Disk Drive in "On". This is indicated on the Hard Disk Drive of which power status is "Powersave".
Make Dive Offline	Make the selected Hard Disk Drive in "Offline" state. This is indicated on the Hard Disk Drive of which status is "Online".
Make Drive Online	Make the selected Hard Disk Drive in "Online" state. This is indicated on the Hard Disk Drive of which status is "Offline".
Rebuild Drive	Start rebuilding VD that contains the selected Hard Disk Drive. This is indicated for the Hard Disk Drive of which status is "Offline".
Mark as Missing	Remove the VD that contains the selected Hard Disk Drive from the DG. This is indicated on the Hard Disk Drive of which status is "Offline".

IMPORTANT: The RAID Controller does not support Events feature.

Configuration Wizard

Use this wizard to configure a virtual drive using the Hard Disk Drives connected. The detailed explanation of this feature is given in "Configuring Virtual Drive".

Controller Selection

You may need to select an adapter controlled by WebBIOS to configure each adapter. Clicking [Controller Selection] on WebBIOS top menu opens the [Adapter Selection] screen.

Physical View / Logical View

If the virtual drive has been configured, DG (drive group) is displayed on WebBIOS Top Menu. Clicking [Physical View] displays information for Hard Disk Drives in DG. Clicking [Logical View] displays virtual drive in DG.

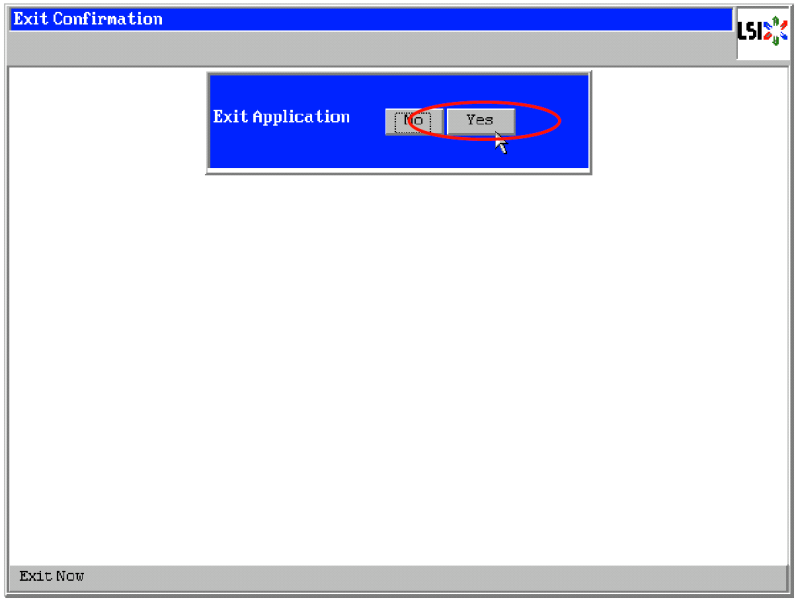
Events

The Events screen is used to confirm the system events.

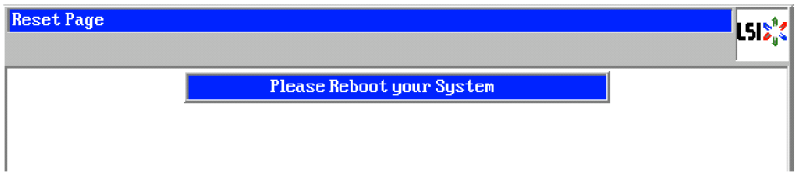
IMPORTANT: The RAID Controller does not support Events feature.

Exit

When you click [Exit] on WebBIOS Top Menu, a confirmation screen to exit from WebBIOS is displayed. Click [Yes] to exit from WebBIOS.



The screen as shown below appears when WebBIOS is terminated. Restart the CPU blade connected with this Storage and I/O Blade.

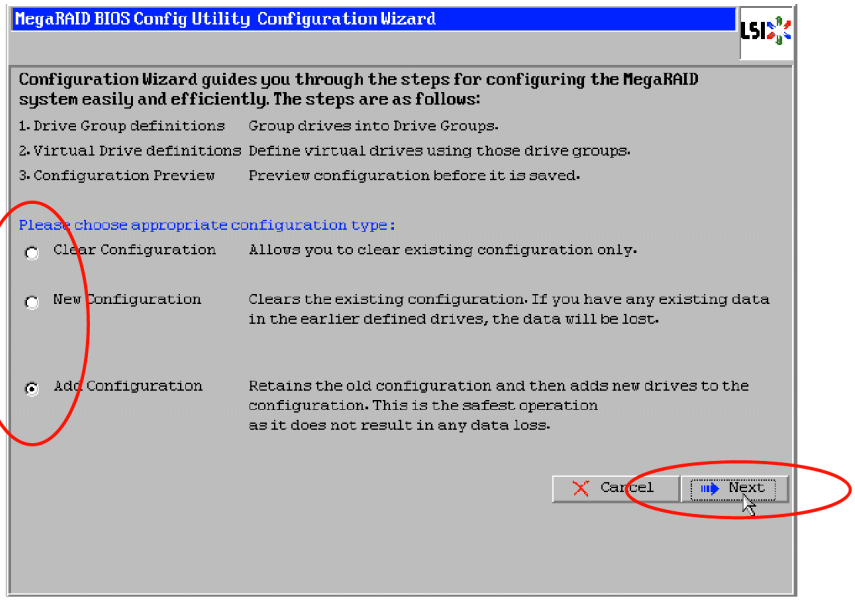


Configuring Virtual Drive

This section describes the procedures for configuration of VD (virtual drive) using WebBIOS.

Configuration Wizard

When you click [Configuration Wizard] on WebBIOS Top Menu, the screen as shown below appears. Select the relevant operation, and click [Next] at lower right of the screen.

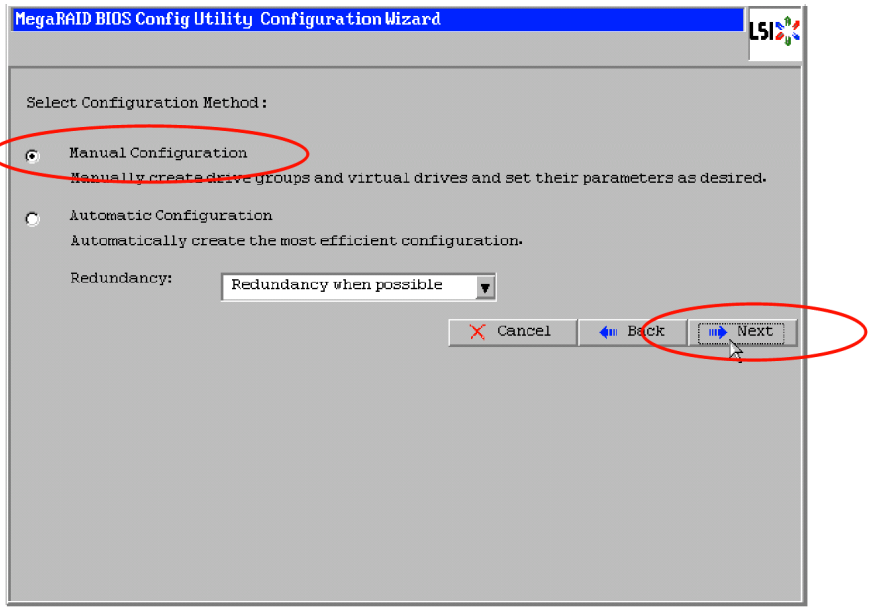

MegaRAID BIOS Config Utility Configuration Wizard
Configuration Wizard guides you through the steps for configuring the MegaRAID system easily and efficiently. The steps are as follows:
1. Drive Group definitions Group drives into Drive Groups.
2. Virtual Drive definitions Define virtual drives using those drive groups.
3. Configuration Preview Preview configuration before it is saved.
Please choose appropriate configuration type:
Clear Configuration Allows you to clear existing configuration only.
New Configuration Clears the existing configuration. If you have any existing data in the earlier defined drives, the data will be lost.
Add Configuration Retains the old configuration and then adds new drives to the configuration. This is the safest operation as it does not result in any data loss.
Cancel
Next

Clear Configuration	Allows you to clear existing configuration (RAID information).
New Configuration	Clears the existing configuration and creates a new VD.
Add Configuration	Retains the old VD and then adds new virtual drive.

IMPORTANT: If you create a VD by New Configuration, any existing data in the earlier defined drives will be lost.

When you select [Add Configuration], the screen as shown below appears.

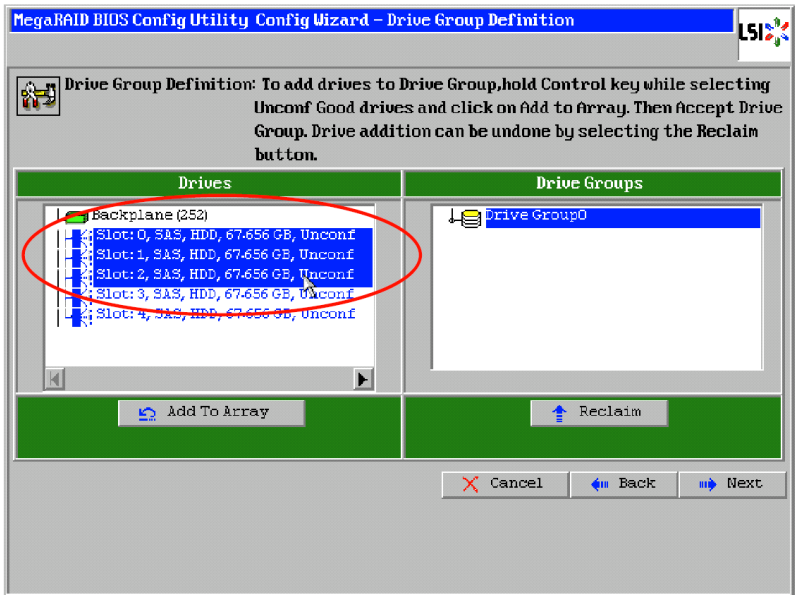
Be sure to select [Manual Configuration], and click [Next].



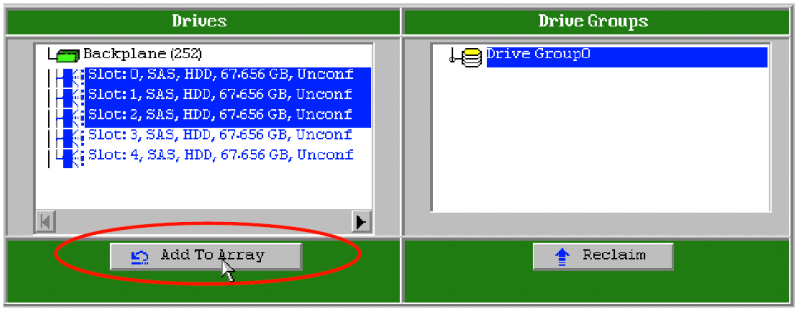
IMPORTANT: The RAID Controller does not support "Automatic Configuration" feature.

Use this menu to define several Hard Disk Drives as a drive group (DG).

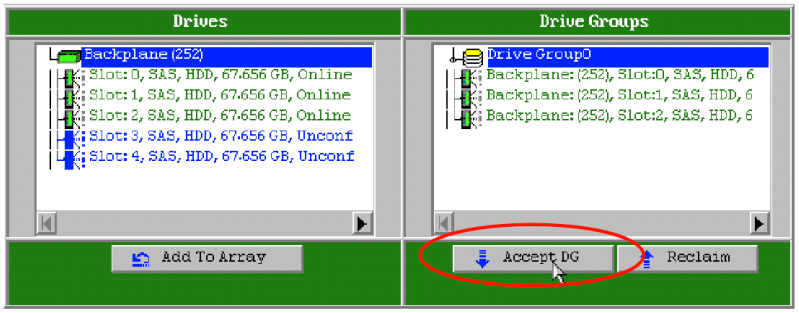
1. While pressing **Ctrl**, click the Hard Disk Drives to be included in DG.


MegaRAID BIOS Config Utility Config Wizard – Drive Group Definition
Drive Group Definition: To add drives to Drive Group,hold Control key while selecting Unconf Good drives and click on Add to Array. Then Accept Drive Group. Drive addition can be undone by selecting the Reclaim button.
Drives
Drive Groups
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Unconf
Slot: 1, SAS, HDD, 67.656 GB, Unconf
Slot: 2, SAS, HDD, 67.656 GB, Unconf
Slot: 3, SAS, HDD, 67.656 GB, Unconf
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group0
Add To Array
Reclaim
Cancel
Back
Next

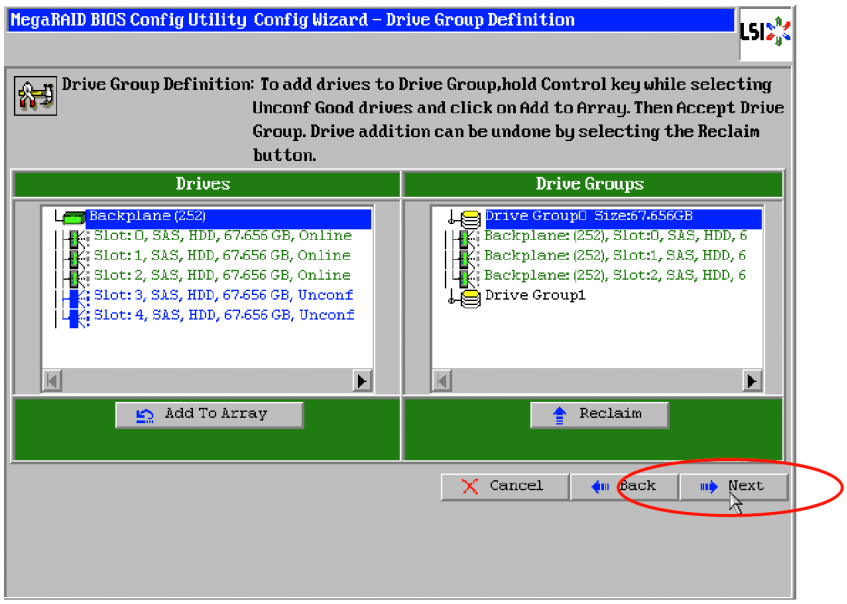
2. Upon completion of selection, click [Add to Array] at the lower left of the screen.


Drives
Drive Groups
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Unconf
Slot: 1, SAS, HDD, 67.656 GB, Unconf
Slot: 2, SAS, HDD, 67.656 GB, Unconf
Slot: 3, SAS, HDD, 67.656 GB, Unconf
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group0
Add To Array
Reclaim

3. A new DG is defined in the Drive Groups frame. To define the new DG, click [Accept DG] at the lower right of the screen.

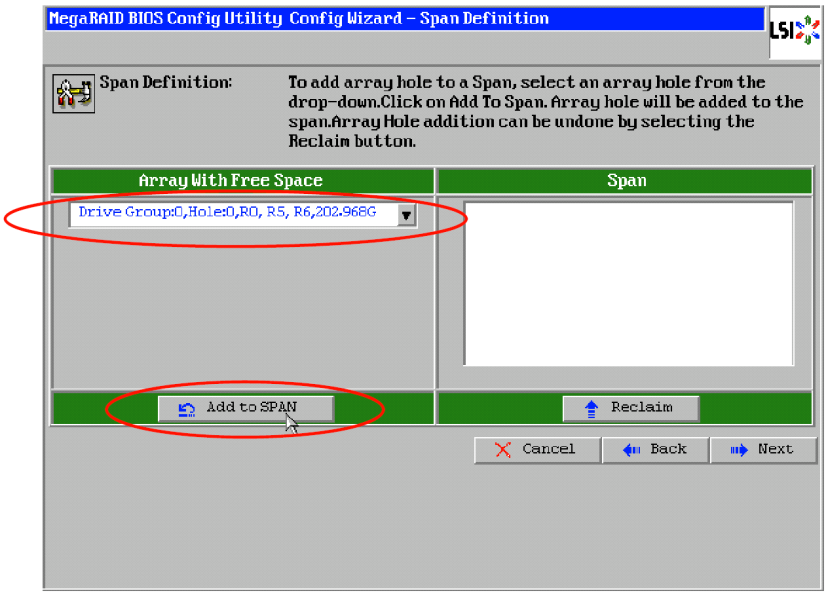

Drives
Drive Groups
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Online
Slot: 1, SAS, HDD, 67.656 GB, Online
Slot: 2, SAS, HDD, 67.656 GB, Online
Slot: 3, SAS, HDD, 67.656 GB, Unconf
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group0
Backplane: (252), Slot:0, SAS, HDD, 6
Backplane: (252), Slot:1, SAS, HDD, 6
Backplane: (252), Slot:2, SAS, HDD, 6
Add To Array
Accept DG
Reclaim

4. After the DG has been defined, click [Next] at the lower right of the screen.

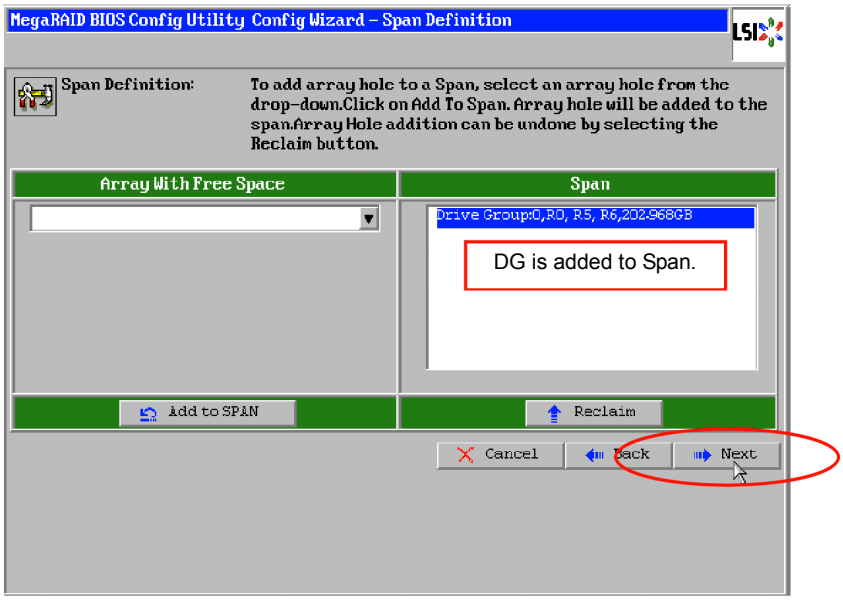

MegaRAID BIOS Config Utility Config Wizard – Drive Group Definition
LSI
Drive Group Definition: To add drives to Drive Group,hold Control key while selecting Unconf Good drives and click on Add to Array. Then Accept Drive Group. Drive addition can be undone by selecting the Reclaim button.
Drives
Drive Groups
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Online
Slot: 1, SAS, HDD, 67.656 GB, Online
Slot: 2, SAS, HDD, 67.656 GB, Online
Slot: 3, SAS, HDD, 67.656 GB, Unconf
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group0 Size:67.656GB
Backplane: (252), Slot:0, SAS, HDD, 6
Backplane: (252), Slot:1, SAS, HDD, 6
Backplane: (252), Slot:2, SAS, HDD, 6
Drive Group1
Add To Array
Reclaim
Cancel
Back
Next

5. Then, the Span Definition screen appears.

6. Select a DG to define VD from "Array With Free Space" frame, then click [Add to SPAN]. The DG is defined in the "Span" field to the right.


MegaRAID BIOS Config Utility Config Wizard – Span Definition
Span Definition:
To add array hole to a Span, select an array hole from the drop-down.Click on Add To Span. Array hole will be added to the span.Array Hole addition can be undone by selecting the Reclaim button.
Array With Free Space
Span
Drive Group:0,Hole:0,R0, R5, R6,202.968G
Add to SPAN
Reclaim
Cancel
Back
Next

7. After the Span has been defined, click [Next] at the lower right of the screen.


MegaRAID BIOS Config Utility Config Wizard – Span Definition
Span Definition:
To add array hole to a Span, select an array hole from the drop-down.Click on Add To Span. Array hole will be added to the span.Array Hole addition can be undone by selecting the Reclaim button.
Array With Free Space
Span
Drive Group:0,R0, R5, R6,202.968GB
DG is added to Span.
Add to SPAN
Reclaim
Cancel
Back
Next

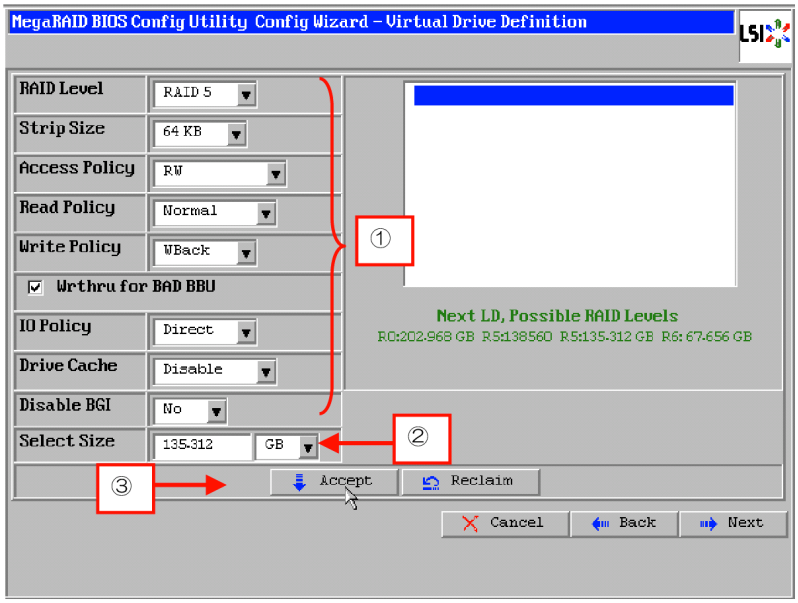
IMPORTANT:

- To configure RAID0, 1, 5, or 6, perform Span Definition to a single DG only. If you need to perform Span Definition to several DGs, define VD for the first DG, then select the next DG to define VD.
- To configure RAID10 or 50, select several DGs containing the same number of Hard Disk Drives for Span Definition.
- Span Definition cannot be performed to DGs containing the different number of Hard Disk Drives.

Define the virtual drive (VD) in DG that has been created in previous step. When DG was defined, [VD Definition] screen is displayed. In the "Next LD, Possible RAID Levels" column, available RAID levels and maximum size for VD are displayed.

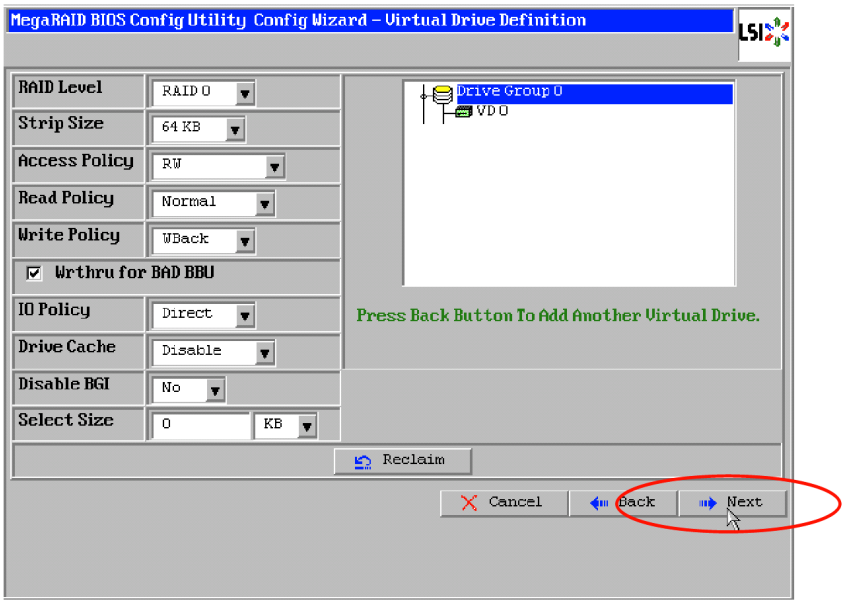
As an example, define a RAID5 VD of 135.312GB.

1. Specify the necessary parameters in left columns.
2. Enter "135.132" in "Select Size" field, and select "GB" as a unit.
3. Click [Accept] at the lower center of the screen.
4. If you want to define another VD, click [Back] and repeat steps starting from Span Definition screen.



IMPORTANT: The value shown in "Select Size" indicates the maximum size allowed for RAID1 (two Hard Disk Drives) or RAID6 (three or more Hard Disk Drives). You need to specify the maximum size for any other RAID levels according to "Next LD, Possible RAID Levels".

5. Upon completion of VD definition, click [Next].

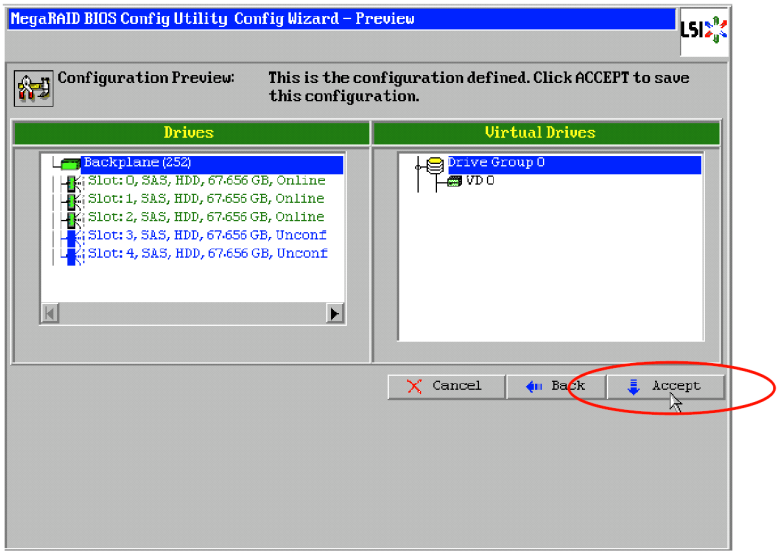


IMPORTANT:

- RAID1 may be configured with three or more Hard Disk Drives in drive group. However, with this controller, the drive group must contain only two Hard Disk Drives.
- WebBIOS does not support the RAID6 logical drive having Stripe Size: 8KB composed of three Hard Disk Drives.

6. VD is created in DG as shown in the screen below.

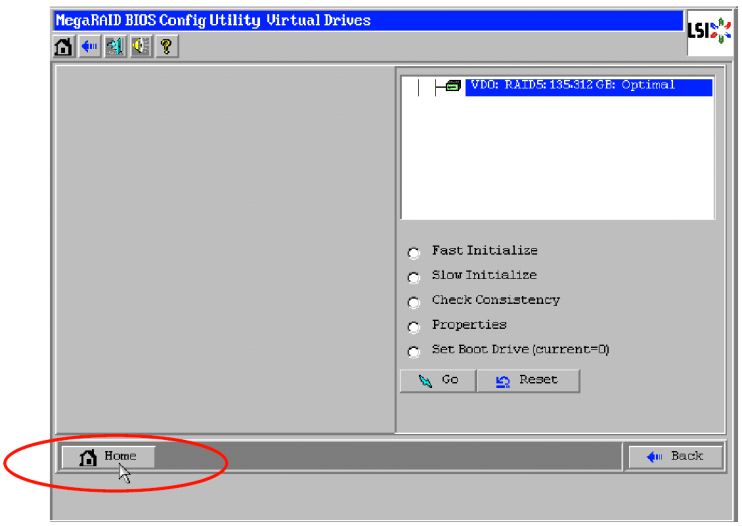
After making sure that the VD is created correctly, click [Accept] at the lower right of the screen.


MegaRAID BIOS Config Utility Config Wizard – Preview
Configuration Preview:
This is the configuration defined. Click ACCEPT to save this configuration.
Drives
Virtual Drives
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Online
Slot: 1, SAS, HDD, 67.656 GB, Online
Slot: 2, SAS, HDD, 67.656 GB, Online
Slot: 3, SAS, HDD, 67.656 GB, Unconf
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group 0
VD 0
Cancel
Back
Accept

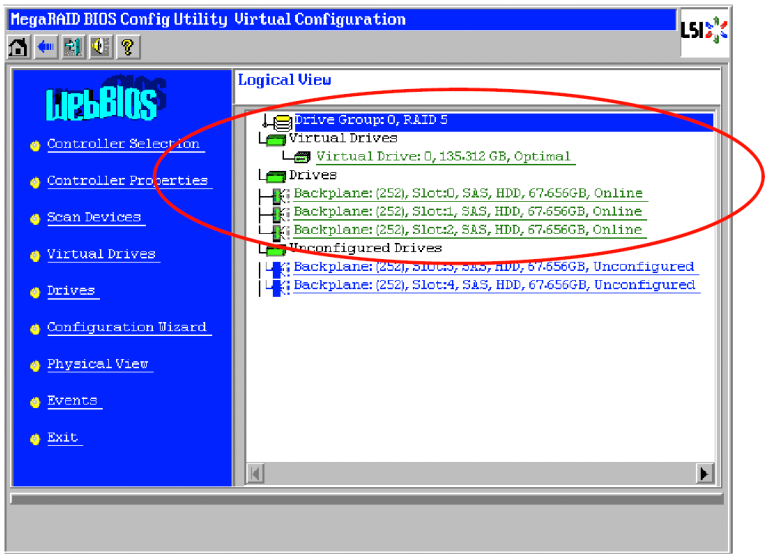
7. The confirmation message "Save this Configuration?" appears. Click [Yes] to save the configuration.

8. The confirmation message "Want to Initialize the New Virtual Drives?" appears. To perform "Fast Initialize", select [Yes].

9. "Virtual Drives" operation screen is displayed. If no other operation is required, click [Home] at the lower left of the screen.



10. WebBIOS Top Menu is displayed. Virtual Drives you have created is displayed in the right frame of the screen.

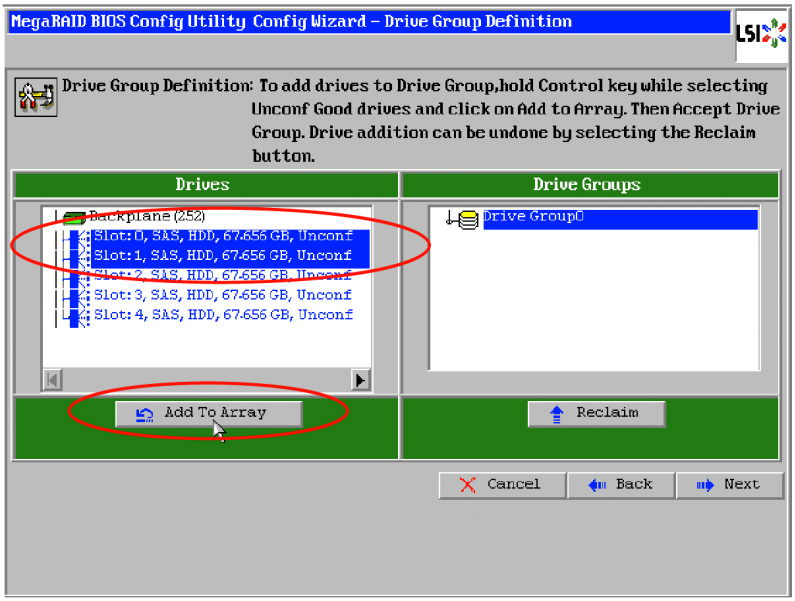


Configure SPAN

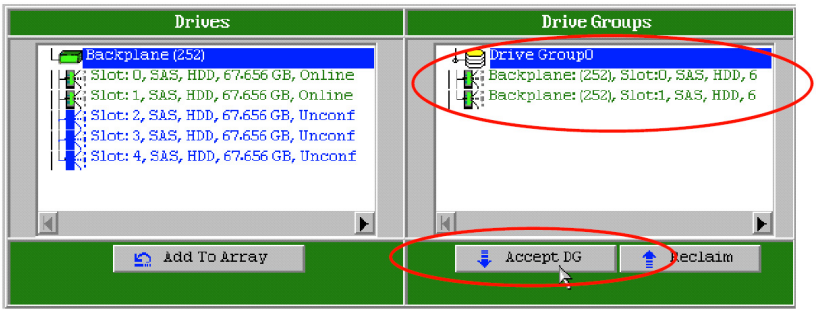
The following explains the sample procedure to configure RAID10 (spanning of RAID1) with four Hard Disk Drives.

> **IMPORTANT:** Do not attempt to configure RAID00 or RAID60. They are not supported.

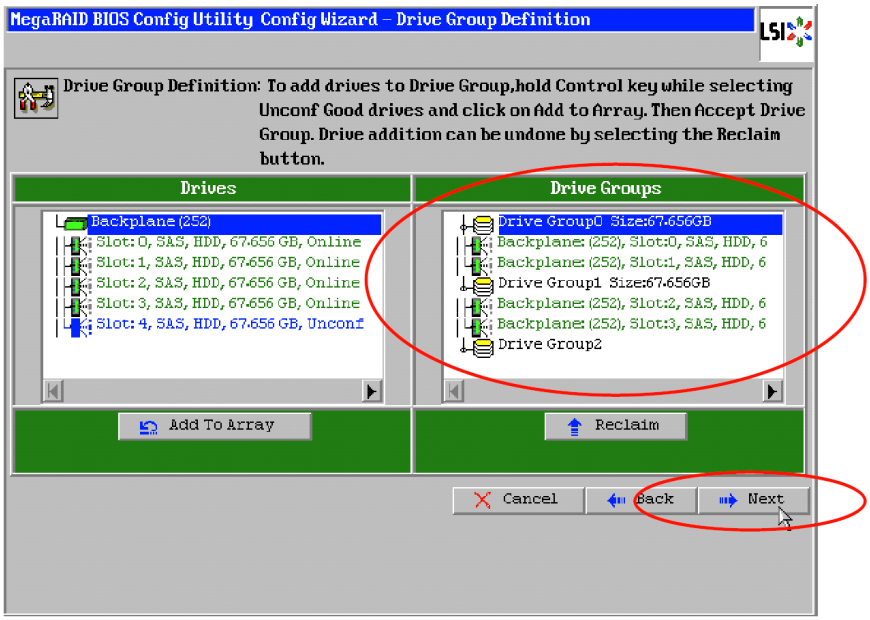
1. Click [Configuration Wizard] on WebBIOS Top Menu to start Wizard.
2. While pressing **Ctrl**, click the Hard Disk Drives to be included in DG. (In the example, two DGs will be configured and spanned.)


MegaRAID BIOS Config Utility Config Wizard – Drive Group Definition
Drive Group Definition: To add drives to Drive Group,hold Control key while selecting Unconf Good drives and click on Add to Array. Then Accept Drive Group. Drive addition can be undone by selecting the Reclaim button.
Drives
Drive Groups
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Unconf
Slot: 1, SAS, HDD, 67.656 GB, Unconf
Slot: 2, SAS, HDD, 67.656 GB, Unconf
Slot: 3, SAS, HDD, 67.656 GB, Unconf
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group0
Add To Array
Reclaim
Cancel
Back
Next

3. Upon completion of selection, click [Add to Array] at the lower left of the screen. After making sure that the new DG has been defined in Drive Groups frame to the right, click [Accept DG].

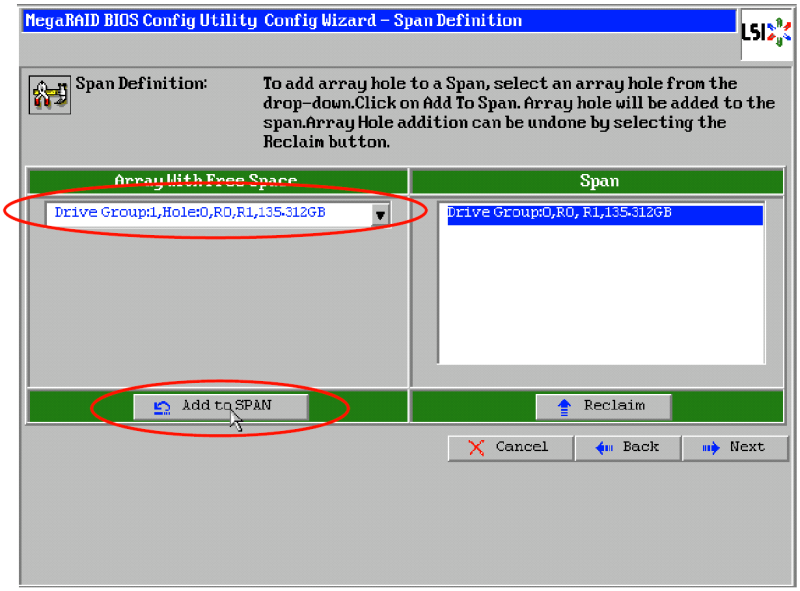

Drives
Drive Groups
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Online
Slot: 1, SAS, HDD, 67.656 GB, Online
Slot: 2, SAS, HDD, 67.656 GB, Unconf
Slot: 3, SAS, HDD, 67.656 GB, Unconf
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group0
Backplane: (252), Slot:0, SAS, HDD, 6
Backplane: (252), Slot:1, SAS, HDD, 6
Add To Array
Accept DG
Reclaim

4. A new DG is defined in the Drive Groups frame. Define another DG in the similar procedures. After DGs have been defined, click [Next] at the lower right of the screen.

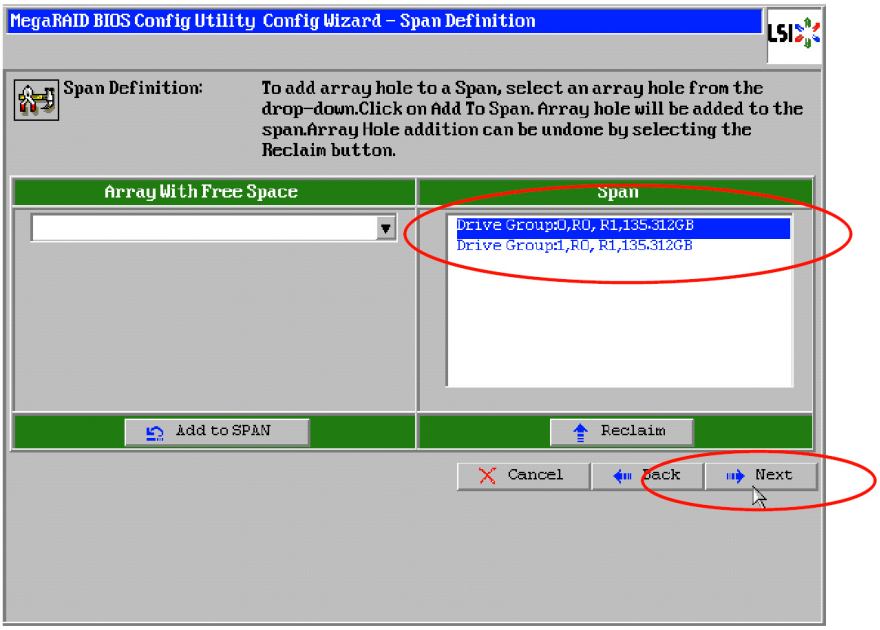

MegaRAID BIOS Config Utility Config Wizard – Drive Group Definition
Drive Group Definition: To add drives to Drive Group,hold Control key while selecting Unconf Good drives and click on Add to Array. Then Accept Drive Group. Drive addition can be undone by selecting the Reclaim button.
Drives
Drive Groups
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Online
Slot: 1, SAS, HDD, 67.656 GB, Online
Slot: 2, SAS, HDD, 67.656 GB, Online
Slot: 3, SAS, HDD, 67.656 GB, Online
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group0 Size:67.656GB
Backplane: (252), Slot:0, SAS, HDD, 6
Backplane: (252), Slot:1, SAS, HDD, 6
Drive Group1 Size:67.656GB
Backplane: (252), Slot:2, SAS, HDD, 6
Backplane: (252), Slot:3, SAS, HDD, 6
Drive Group2
Add To Array
Reclaim
Cancel
Back
Next

5. When DGs were defined, [Span Definition] screen is displayed.

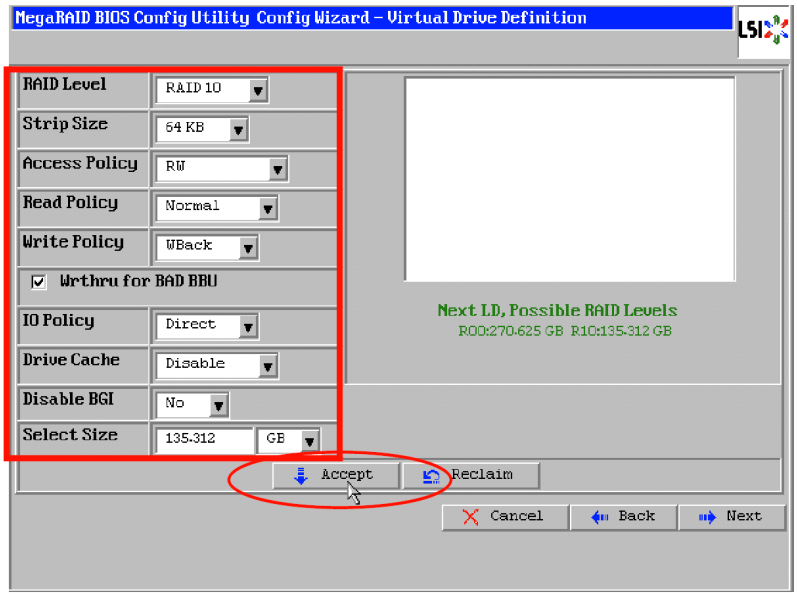
6. Select DG0 from "Array With Free Space" frame, then click [Add to SPAN]. The DG is defined in the "Span" field to the right.


MegaRAID BIOS Config Utility Config Wizard – Span Definition
Span Definition:
To add array hole to a Span, select an array hole from the drop-down.Click on Add To Span. Array hole will be added to the span.Array Hole addition can be undone by selecting the Reclaim button.
Array With Free Space
Span
Drive Group:1,Hole:0,R0,R1,135.312GB
Drive Group:0,R0, R1,135.312GB
Add to SPAN
Reclaim
Cancel
Back
Next

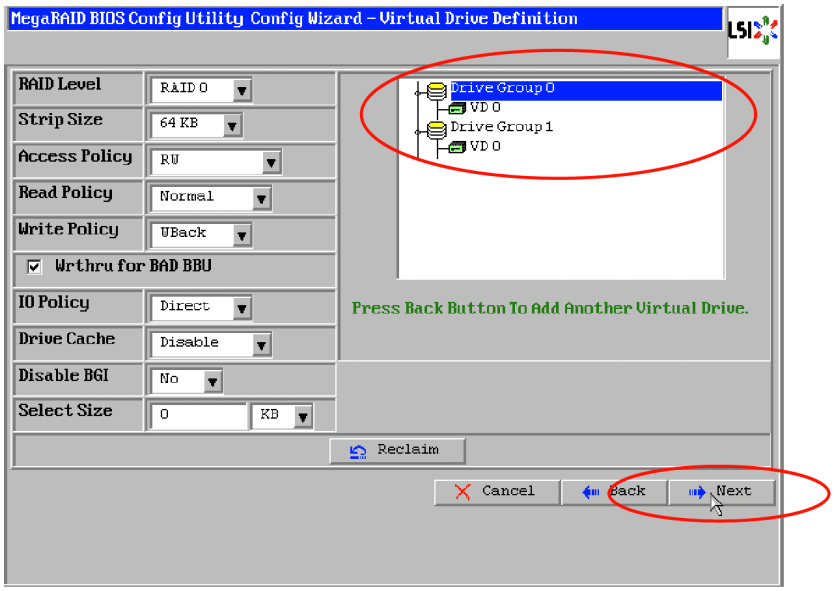
7. Then, select DG1 and click [Add to SPAN]. When the two DGs are defined in the "Span" field to the right, click [Next] at the lower right of the screen.


MegaRAID BIOS Config Utility Config Wizard – Span Definition
Span Definition:
To add array hole to a Span, select an array hole from the drop-down.Click on Add To Span. Array hole will be added to the span.Array Hole addition can be undone by selecting the Reclaim button.
Array With Free Space
Span
Drive Group:0,R0, R1,135.312GB
Drive Group:1,R0, R1,135.312GB
Add to SPAN
Reclaim
Cancel
Back
Next

8. The VD Definition screen is displayed. Enter the necessary parameters, and click [Accept].

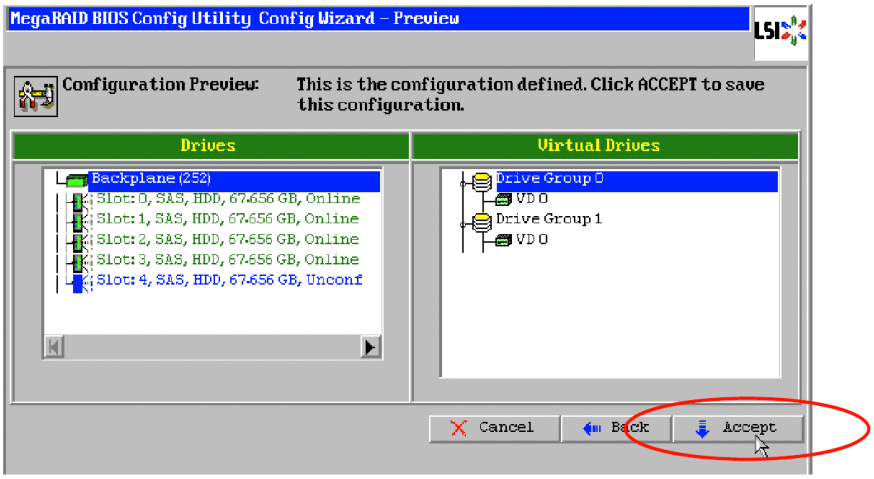


9. Make sure that both DG0 and DG1 are defined as VD 0, then click [Next] at the lower right of the screen.



IMPORTANT: RAID10 may be configured with three or more Hard Disk Drives in each span. However, with this controller, each drive group must contain only two Hard Disk Drives.

10. On the "Preview" screen, make sure the VD is defined correctly, then click [Accept] at the lower right of the screen.

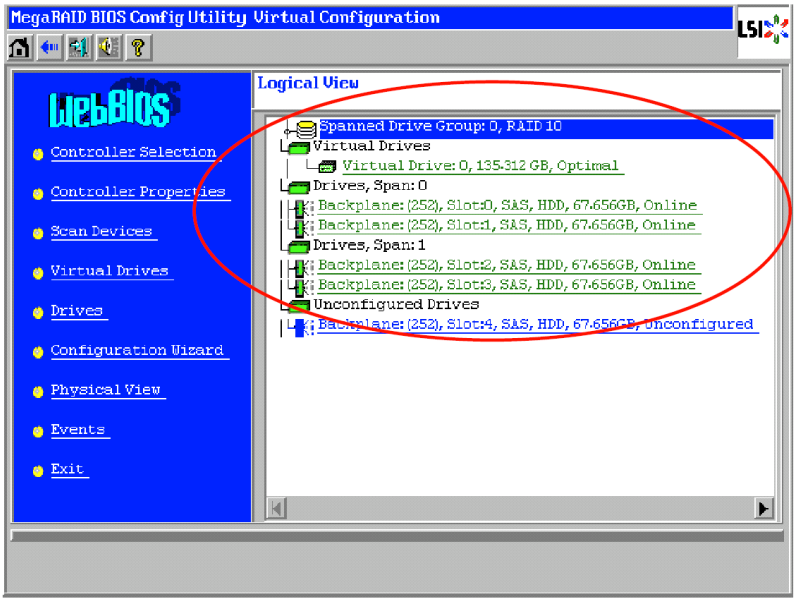

MegaRAID BIOS Config Utility Config Wizard – Preview
Configuration Preview:
This is the configuration defined. Click ACCEPT to save this configuration.
Drives
Virtual Drives
Backplane (252)
Slot: 0, SAS, HDD, 67.656 GB, Online
Slot: 1, SAS, HDD, 67.656 GB, Online
Slot: 2, SAS, HDD, 67.656 GB, Online
Slot: 3, SAS, HDD, 67.656 GB, Online
Slot: 4, SAS, HDD, 67.656 GB, Unconf
Drive Group 0
VD 0
Drive Group 1
VD 0
Cancel
Back
Accept

11. The confirmation message "Save this Configuration?" appears. Click [Yes] to save the configuration.

12. The confirmation message "All data on the new Virtual Drives will be lost. Want to Initialize?" appears. Click [Yes] to perform "Fast Initialize".

13. "Virtual Drives" operation screen is displayed. If no other operation is required, click [Home] at the lower left of the screen.

14. The WebBIOS Top Menu is displayed. Virtual Drives you have created are displayed in the right frame of the screen.



Parameters for VD Definition

Listed below are parameters for Configuration Wizard.

Item	Parameter	Remarks
RAID Level	**RAID 0** / **RAID 1** / **RAID 5** / **RAID 6** / RAID 00 / **RAID 10** / **RAID 50** / RAID60	RAID 00 and RAID 60 are not supported.
Strip Size	8 KB / 16 KB / 32 KB / **64 KB** / 128 KB / 256 KB / 512 KB / 1024 KB	Recommended value: 64KB
Access Policy	**RW** / Read Only / Blocked	Recommended value: RW
Read Policy	**Normal** / Ahead / Adaptive	Recommended value: Normal
Write Policy	**WBack** / **Wthru**	WBack: WriteBack WThru: WriteThru
WrtThru for BAD BBU	Checked / Unchecked	Select a mode when WriteBack is specified for Write Policy. Checked: Normal WriteBack Unchecked: Constant WriteBack Recommended value: Checked
IO Policy	**Direct** / Cached	Recommended value: Direct
Disk Cache Policy	Unchanged / Enabled / **Disabled**	Recommended value: Disabled
Disable BGI	**No** / Yes	Specify whether to perform Background Initialize after creation of VD. Recommended value: No

IMPORTANT: BGI (Back Ground Initialize) is available only for the following VDs:
– RAID5 VD configured with five or more physical devices.

The Write Policy has the following modes depending on combination with WrtThru for BAD BBU. Select a mode suitable for your environment.

		WrtThru forBAD BBU	
		Checked	**Unchecked**
Write Policy	WBack	Normal write back mode (recommended) The controller uses cache memory for writing. However, if the battery is being charged or failed, the controller operates in WThru (write through) mode automatically. Thus, this mode can provide higher data security.	Constant write back mode The controller always uses cache memory for writing regardless of battery charged status or existence of battery. Be sure to use UPS when specifying this mode for write policy.
	WThru	Write through mode The controller does not use cache memory for writing data. This mode can provide the highest data security, however, the writing performance is lower than that in write back mode.	* This mode is unavailable. If you do not check "WrtThru for BAD BBU" at creation of VD, this item is automatically checked after the VD has been created.

IMPORTANT:

- If constant write back mode is selected, the controller operates in write back mode even if the battery has failed or insufficiently charged. The data in cache memory may be lost at an occurrence of power failure.
- Be sure to use UPS when specifying the constant write back mode for write policy.

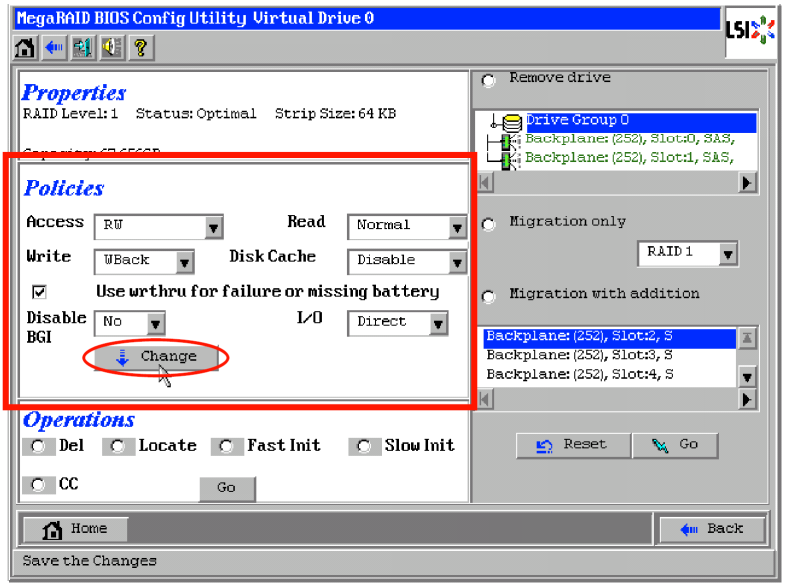
The Disk Cache Policy has the following modes. Select a mode suitable for your environment.

Unchanged	• The controller uses the default write cache policy of hard disk drive. • The default value may not be identical to the factory-set value, therefore, do not specify this mode.
Enabled	• The controller always uses the write cache policy of hard disk drive. • Be sure to use UPS when specifying this mode for disk cache policy.
Disabled	• The controller does not use the write cache policy of the hard disk drive. • This mode can provide the highest data security, however, the writing performance is lower than that in Enabled mode. • It is recommended to use this mode for the sake of data security.

IMPORTANT:

- If "Unchanged" is specified for Disk Cache Policy, the default value may not be identical to the factory-set value, therefore, do not specify this mode.
- If Enabled is specified for Disk Cache Policy, the controller uses the write cache policy of the hard disk drive. Accordingly, the data in cache memory of the hard disk drive may be lost at an occurrence of power failure.
- Be sure to use UPS when using the cache memory of the hard disk drive.

You can change parameters for VD definition except for RAID Level and Stripe Size. On the WebBIOS Top Menu, click [Virtual Drives] and specify parameters in "Policies" frame, then click [Change].

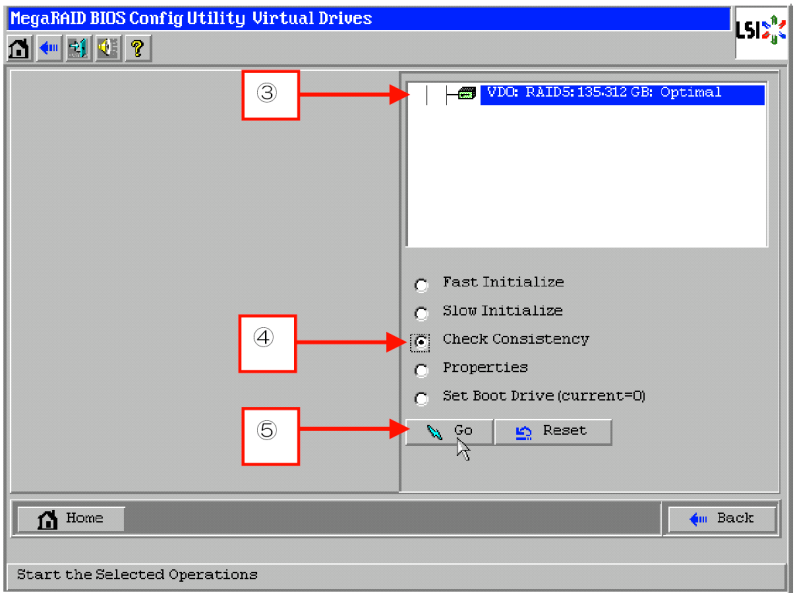


Operation of Various Features

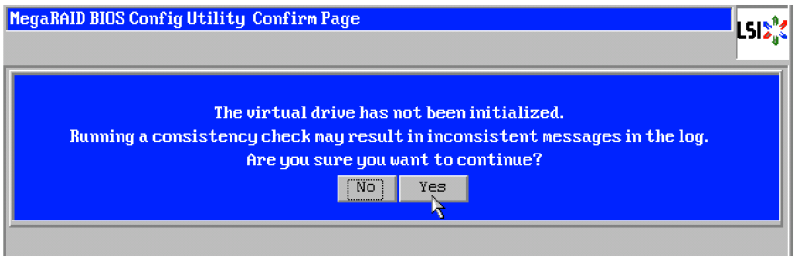
Check Consistency

Check Consistency is used to check consistency among virtual drives.

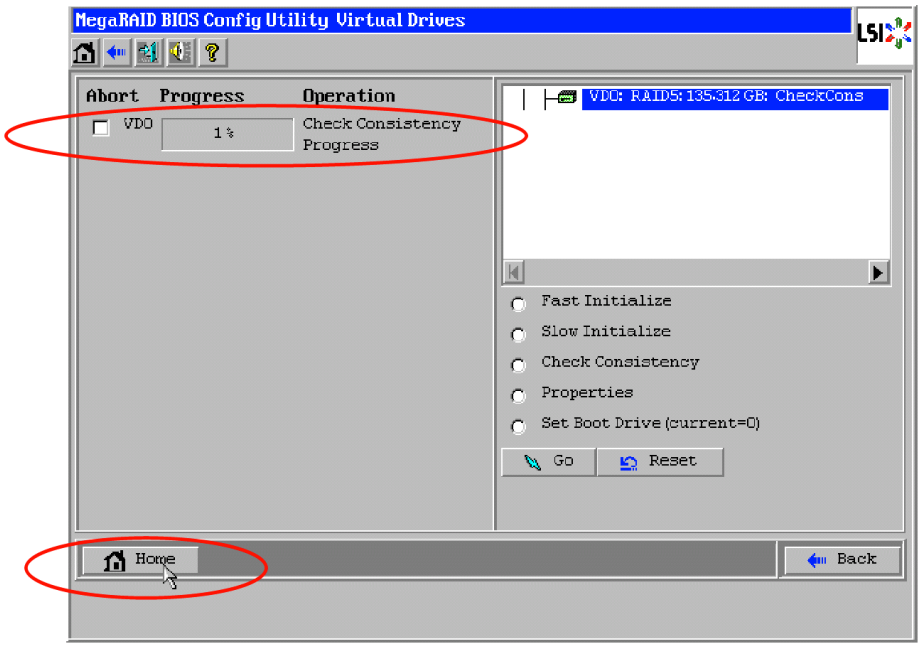
1. Start WebBIOS on POST screen of CPU blade.
2. Click [Virtual Drives] on WebBIOS Top Menu.
3. Select a VD to perform Check Consistency from the upper right frame of Virtual Drives screen.
4. Click the checkmark column for Check Consistency from the lower right frame of Virtual Drives screen.
5. Make sure that Check Consistency is checked, and click [Go].



6. Inconsistency may be detected at Check Consistency performed immediately after the VD was configured. If the following alert is displayed, click [Yes] to perform Check Consistency. A lot of inconsistency may be detected, however, it is not a failure.


MegaRAID BIOS Config Utility Confirm Page
The virtual drive has not been initialized.
Running a consistency check may result in inconsistent messages in the log.
Are you sure you want to continue?
No
Yes

7. The progress of Check Consistency is displayed on the left frame of Virtual Drives screen.
8. Click [Home] at the lower left of Virtual Drives screen to return to the Top Menu.



IMPORTANT: A lot of inconsistency may be detected at Check Consistency performed immediately after the VD was configured due to inconsistencies in the unused area. In such a case, an alert may be logged.

Manual Rebuild

Rebuild can be performed automatically when the failed Hard Disk Drive is replaced in hot-swap mode. However, if the failed Hard Disk Drive is replaced after turning off the power of the CPU blade connected with this Storage and I/O Blade, Rebuild will not start automatically. Use Manual Rebuild feature to recover the virtual drives as described below.

IMPORTANT:

- To perform rebuild by replacing the Hard Disk Drive in hot-swap mode, be sure to replace the device while the operating system or WebBIOS is running.
- You can view the progress of rebuild process on Universal RAID Utility screen or click [Virtual Drive] on WebBIOS Top Menu.
- With the progress indication being displayed, the rebuild may be processed at slow rate. Go to WebBIOS Top Menu after making sure the rebuild progress.

Described below are procedures based on assumption:
One of the Hard Disk Drives failed in a RAID5 VD configured with three Hard Disk Drives.

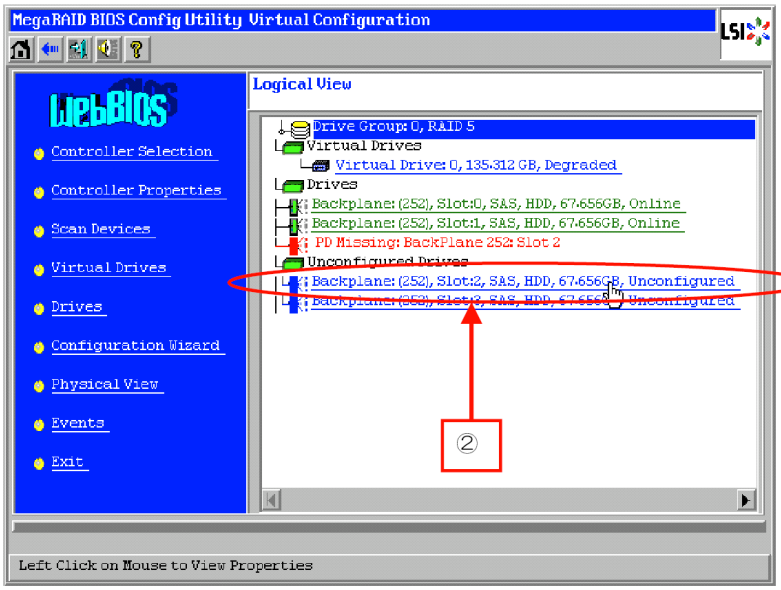
Replace the failed Hard Disk Drive with new one after turning off the power of the CPU blade connected with this Storage and I/O Blade. Auto Rebuild feature is disabled for non-hot-swap replacement. Use Manual Rebuild feature to recover the virtual drives as described below.

1. Start WebBIOS on POST screen of CPU blade.

   Make sure that the status for the replaced Hard Disk Drive is indicated as "Unconfigured Good" in the right frame of the Top Menu.

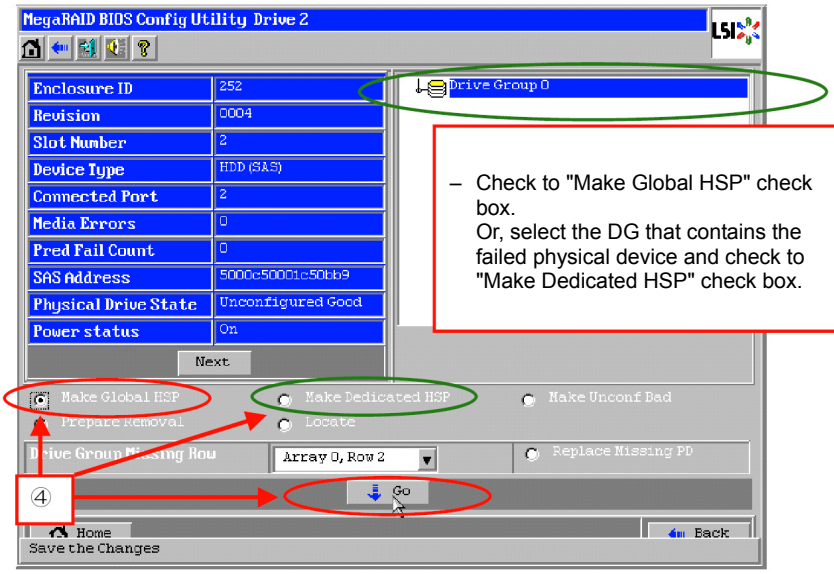
   In the example below, the Hard Disk Drive in slot number 2 has been replaced.
   The indication "PD Missing: BackPlane 252: Slot2" represents that the Hard Disk Drive in VD having been installed in slot number 2 was removed.

2. Select the newly connected Hard Disk Drive (the Hard Disk Drive in slot number 2 in the example) from the right frame of Top Menu.

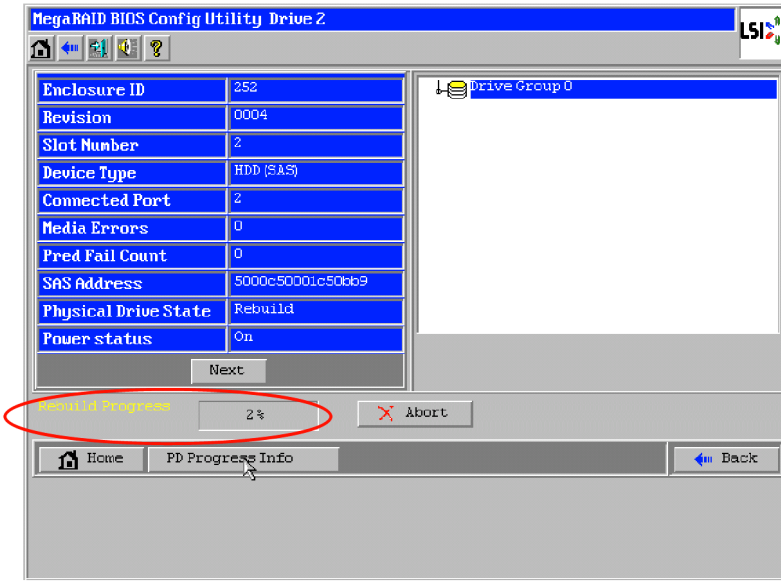


3. The properties for Physical Drive is displayed.

4. Check to "Make Global HSP" or select the DG you want to rebuild and check to "Make Dedicated HSP", and then click [Go] on the lower center of the screen.

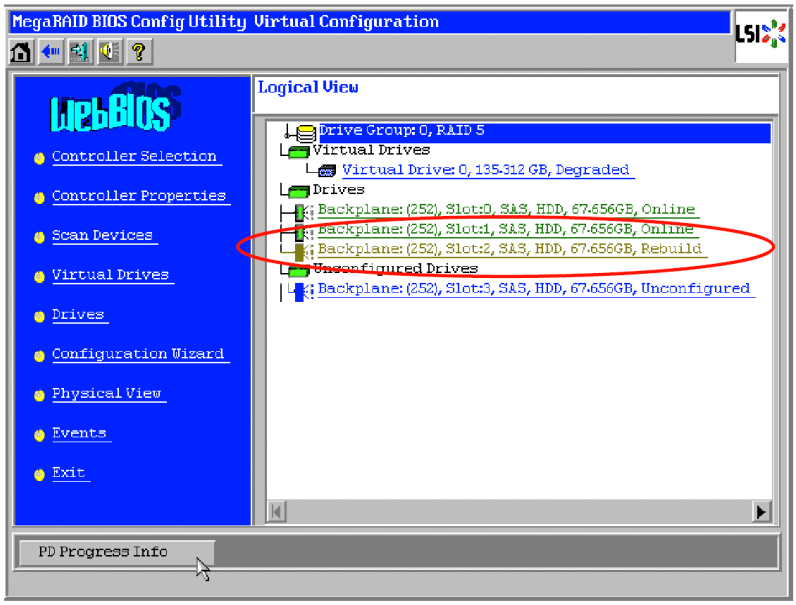


5. When [Rebuild Progress] is displayed, click [Home] at the lower left of the screen to go back to WebBIOS Top Menu.

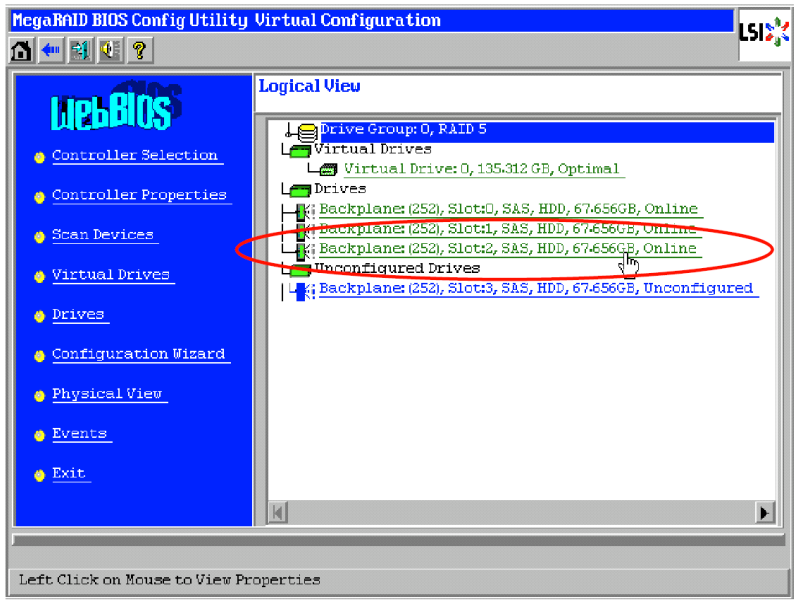


IMPORTANT: Click [Home] while the background task such as Consistency Check, Rebuild, or Reconstruction is being executed. With the progress indication being displayed, the background task may be processed at slow rate.

6. The WebBIOS Top Menu changes as shown below during rebuild. If you click on Physical Drive being rebuilt, the progress of rebuild is displayed.



7. When the rebuild completes, the status for the Physical Drive is "Online" and that of the Virtual Drive is "Optimal".



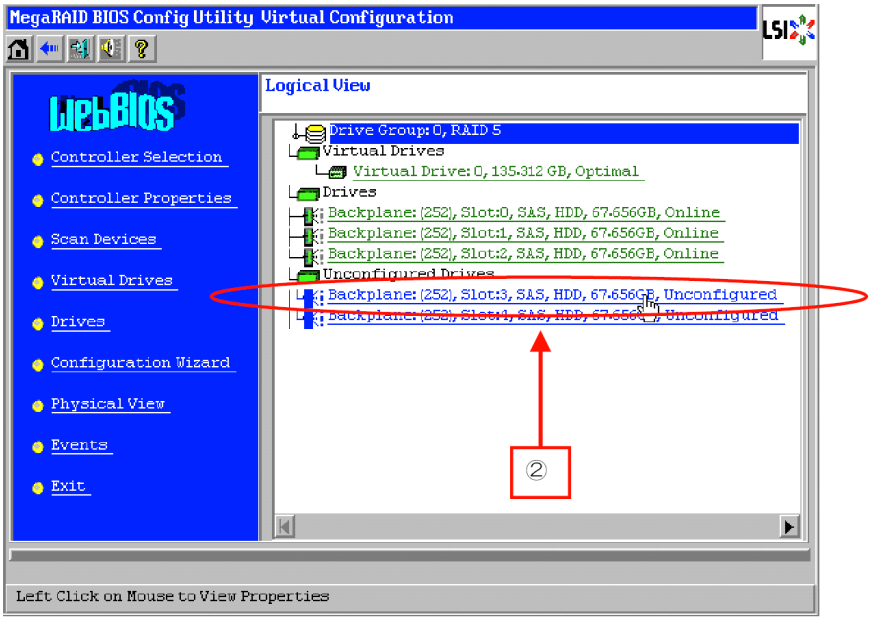
Setting Hot Spare

Described below are procedures based on assumption:
Add a Hard Disk Drive to a RAID5 VD configured with three Hard Disk Drives and assign a newly added Hard Disk Drive as Hot Spare Disk.

1. Start WebBIOS on POST screen of CPU blade.

   Make sure that the status for the added Hard Disk Drive is indicated as "Unconfigured Good" in the right frame of the Top Menu.

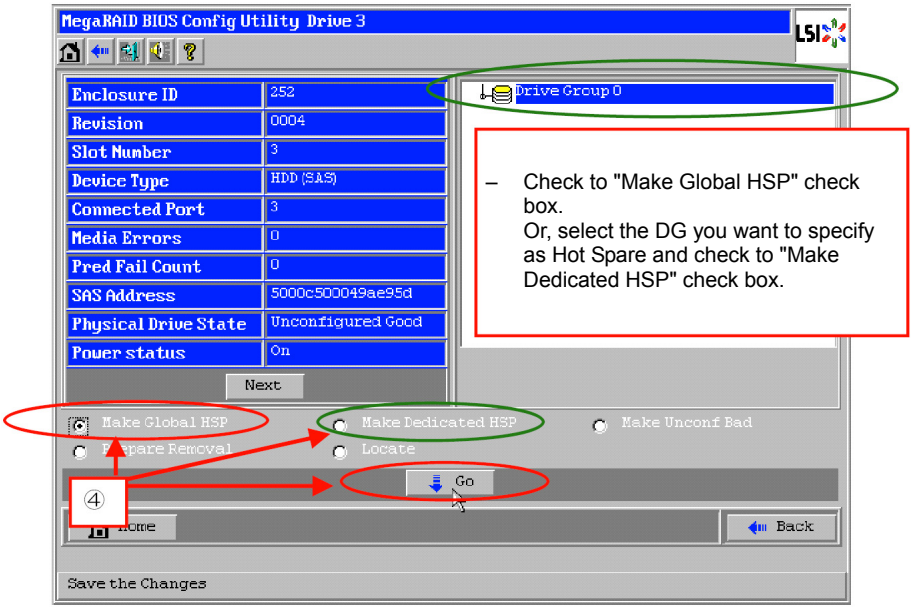
2. Select the newly connected Hard Disk Drive (the Hard Disk Drive in slot number 3 in the example) from the right frame of Top Menu.



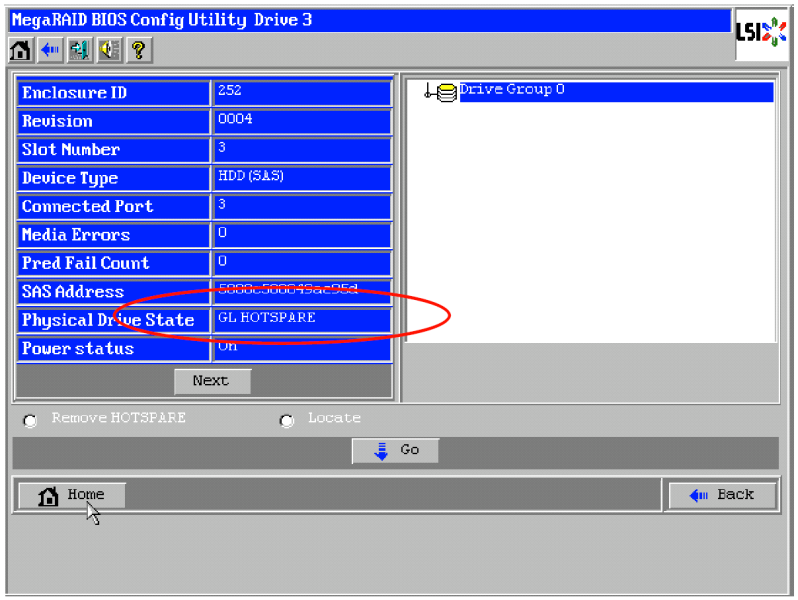
3. The properties for Physical Drive is displayed.

4. Check to "Make Global HSP" or select the DG you want to specify as Hot Spare and check to "Make Dedicated HSP", and then click [Go] on the lower center of the screen.

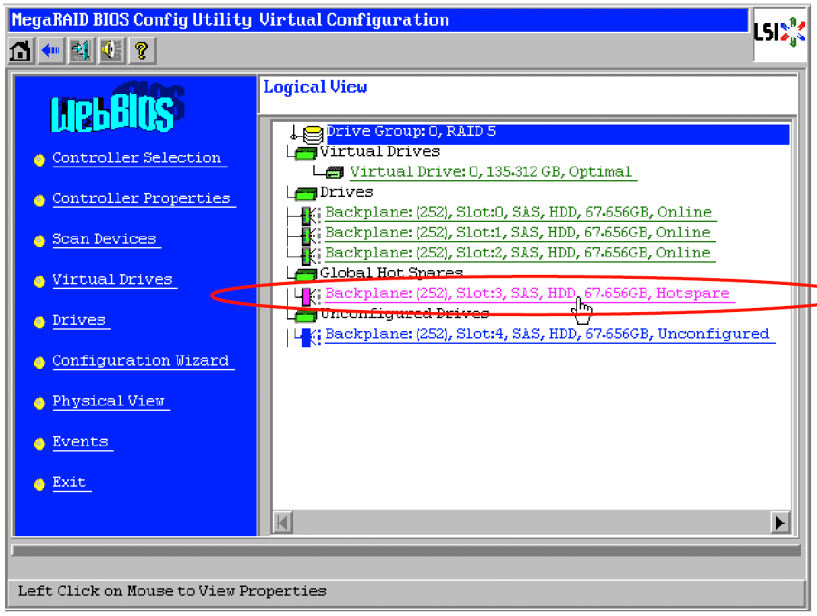
Global HSP	Indicates the Hot Spare available for all DGs.
Dedicated HSP	Indicates the Hot Spare available only for the specific DG. You need to specify the target DG.



5. The status for the newly connected Hard Disk Drive changes to "GL HOTSPARE" or "DED HOTSPARE".



6. Click [Home] at the lower left of the screen to go back to WebBIOS Top Menu.



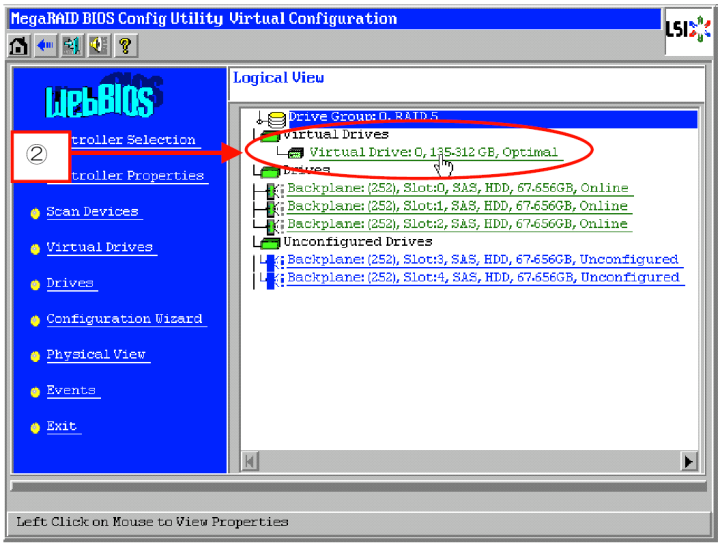
Reconstruction

Described below are procedures based on assumption:
Add a Hard Disk Drive to a RAID5 VD configured with three Hard Disk Drives to make a RAID5 VD configured with four Hard Disk Drives.

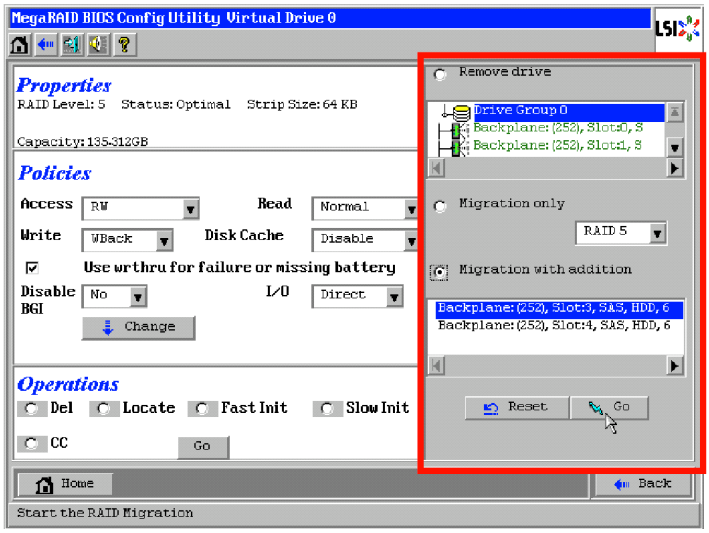
1. Start WebBIOS on POST screen of CPU blade.

   Make sure that the status for the added Hard Disk Drive is indicated as "Unconfigured Good" in the right frame of the Top Menu.

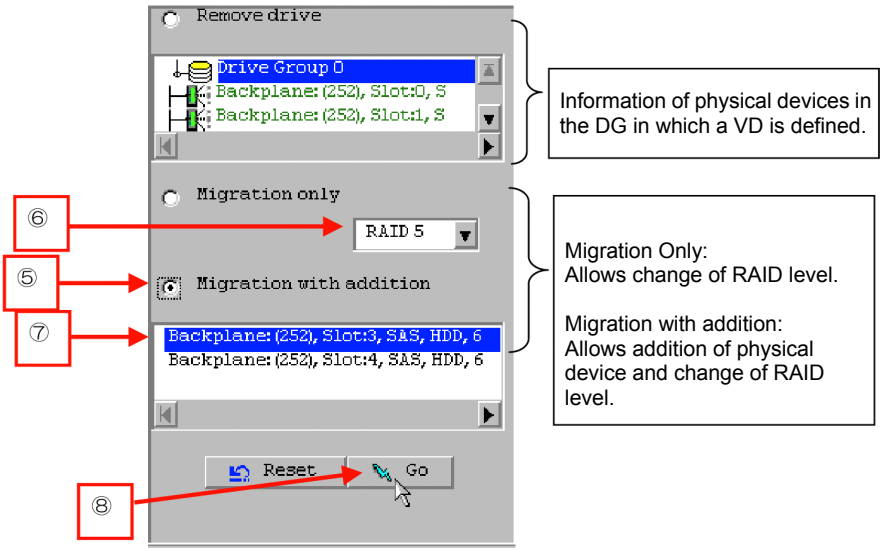
2. Select a VD you want to reconstruct (VD 0 in the example) from the right frame of Top Menu.



3. Setting menu for VD is displayed.



4. On the right of the screen, items required for reconstruction are displayed.



5. Select "Migration with addition".
6. Specify the RAID level used after reconstruction.
7. Select a Hard Disk Drive to be added.
8. When you finished Steps 5 to 7, click [Go] at the lower right of the screen.
9. The progress of reconstruction is displayed on the lower left of the screen. Click [Home] at the lower left of the screen to return to the WebBIOS Top Menu.

IMPORTANT:

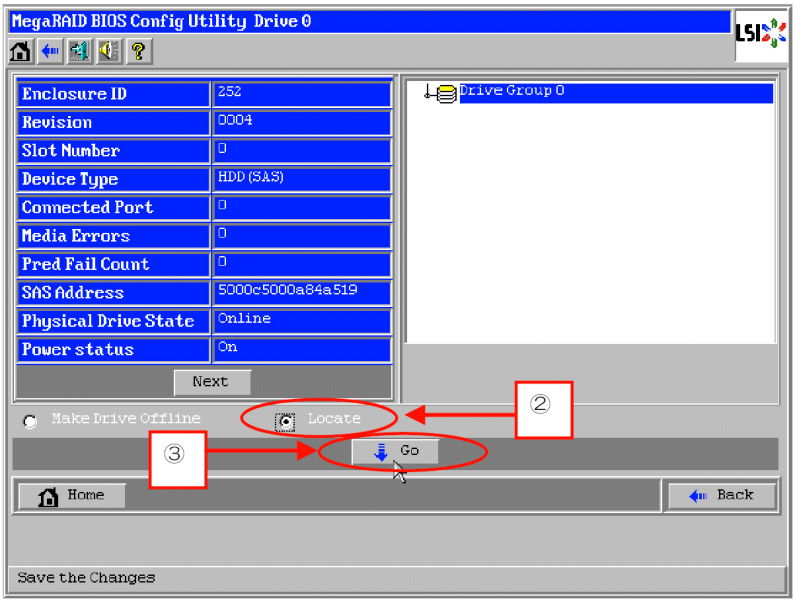
- The capacity of virtual drive may be incorrectly displayed after reconstruction. In this case, perform Scan Devices from the Top Menu.
- Click [Home] while the background task such as Consistency Check, Rebuild, or Reconstruction is being executed. With the progress indication being displayed, the background task may be processed at slow rate.

Locate

The Locate command makes an LED on Hard Disk Drive light or blink to confirm the location of the slot. We recommend you to check the slot of Hard Disk Drive before adding VD or hot spare disks, reconstructing VD, or replacing Hard Disk Drive.

How to execute Locate command on WebBIOS

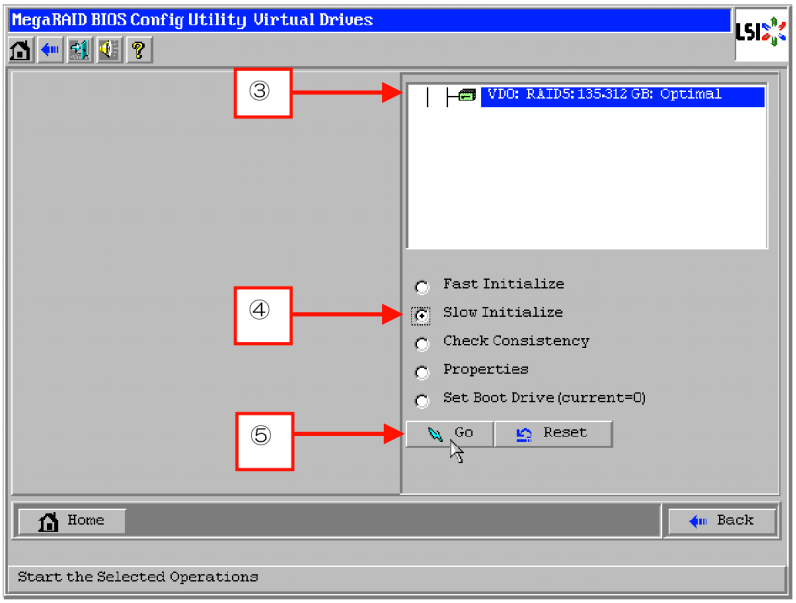
1. Click a Physical Drive to check the location on the WebBIOS Top Menu.
2. The Physical Drive properties are displayed. Click [Locate].
3. Click [Go]. The LED of the Hard Disk Drive lights or blinks.



Slow Initialize

Slow Initialize writes zero to all the sectors of the data area in the VD.

1. Start WebBIOS on POST screen of CPU blade.
2. Click [Virtual Drives] on the WebBIOS Top Menu.
3. Select a VD to perform Slow Initialize from the upper right frame of the Virtual Drives screen.
4. Click the checkmark column for Slow Initialize from the lower right frame of the Virtual Drives screen.
5. Make sure that Slow Initialize is checked, and click [Go].



IMPORTANT:

- To create a VD using the Configuration Wizard of WebBIOS, execute Fast Initialize to clear the first sector that contains partition information.
- Slow Initialize takes a long time to complete.

WebBIOS and Universal RAID Utility

You can use Universal RAID Utility for configuration and management, monitoring of RAID System after start up operating system.

The point to be kept in mind when using Universal RAID Utility together with WebBIOS is as follows.

Terms

Terms used in WebBIOS differs from those used in Universal RAID Utility.

When you use Universal RAID Utility together with WebBIOS, substitute terms according to the following list.

Term of WebBIOS	Term of Universal RAID Utility
Controller (Adapter)	RAID Controller
Virtual Drive	Logical Drive
Drive Group	Disk Array
Physical Drive	Physical Device

Number and ID

The number to manage each component of RAID System used in Universal RAID Utility differs from that used in WebBIOS.

Adapter and RAID Controller

WebBIOS manages Adapter by a number beginning with 0. You can see a number of Adapter where [Adapter No] in [Adapter Selection] menu.

Universal RAID Utility manages RAID Controller by a number beginning with 1. You can see a number of RAID Controller where [Number] in the property of RAID Controller on RAID Viewer or [RAID Controller #X] in the property of RAID Controller on raidcmd.

In addition, you can see the number of Adapter managed by WebBIOS where [ID] in the property of RAID Controller by Universal RAID Utility.

Virtual Drive and Logical Drive

WebBIOS manages Virtual Drive by a number beginning with 0. You can see a number of Virtual Drive where [VD X] in Virtual Drives.

Universal RAID Utility manages Logical Drive by a number beginning with 1. You can see a number of Logical Drive where [Number] in the property of Logical Drive on RAID Viewer or [RAID Controller #X Logical Drive #Y] in the property of Logical Drive on raidcmd.

In addition, you can see the number of Logical Drive managed by WebBIOS where [ID] in the property of Logical Drive by Universal RAID Utility.

Disk Array

WebBIOS manages Disk Array by a number beginning with 0. You can see a number of Disk Array where [DG X] in Physical Drives and Virtual Drives.

Universal RAID Utility manages Disk Array by a number beginning with 1. You can see a number of Disk Array where [Disk Array] in the property of Logical Drive on RAID Viewer or [RAID Controller #X Disk Array #Y] in the property of Disk Array on raidcmd.

Physical Drive and Physical Device

WebBIOS manages Physical Drive by two numbers (Slot number and Connector number, beginning with 0). You can view these numbers shown by [x:x:x] in Physical Drives box. You can view these numbers on Physical Drives properties.

Universal RAID Utility manages Physical Device by a number beginning with 1 and ID, Enclosure number, and Slot number. The numbers of Hard Disk Drives connected to the controller are sorted in ascending order based on ID and assigned number beginning with 1, starting from the smallest number. The ID is same value of Slot number shown in WebBIOS. Enclosure number and Slot number are assigned with a number beginning with 1. To view these numbers on Universal RAID Utility, select properties of the Hard Disk Drive and see [Number] and [ID], [Enclosure], and [Slot] (RAID Viewer), or [RAID Controller #X Physical Drive #Y] and [ID], [Enclosure], and [Slot] (raidcmd).

Setting of Priority

WebBIOS displays and sets Rebuild Priority, Patrol Read Priority, and Consistency Check Priority of RAID Controller by percentage. However, Universal RAID Utility uses three levels as High/Middle/Low for them.

NOTES:

- WebBIOS can set BGI Rate (Background Initialize Priority). However, Universal RAID Utility cannot set it.
- Universal RAID Utility can set Initialization Priority. However, Internal RAID Controller does not have the function of the setting of Initialization Priority. Therefore, Universal RAID Utility does not display [Initialization Priority] in the [Options] tab of RAID Viewer. In addition, you will fail if you change the Initialization Priority by raidcmd.

See the table below for correspondence.

Setting value of WebBIOS and the display level of Universal RAID Utility

Item	Setting value of WebBIOS	Universal RAID Utility level
Rebuild Priority Rebuild Rate (WebBIOS)	80 to 100	High
	31 to 79	Middle
	0 to 30	Low
Patrol Read Priority Patrol Read Rate (WebBIOS)	80 to 100	High
	31 to 79	Middle
	0 to 30	Low
Consistency Check Priority CC Rate (WebBIOS)	80 to 100	High
	31 to 79	Middle
	0 to 30	Low

Setting level of Universal RAID Utility and the setting value

Item	Setting level of Universal RAID Utility	Setting value
Rebuild Priority Rebuild Rate (WebBIOS)	High	90
	Middle	50
	Low	10
Patrol Read Priority Patrol Read Rate (WebBIOS)	High	90
	Middle	50
	Low	10
Consistency Check Priority CC Rate (WebBIOS)	High	90
	Middle	50
	Low	10

Creating a RAID 6 Logical Drive

To create a Logical Drive of RAID 6 using the Universal RAID Utility, at least four Hard Disk Drives are required. If you want to create a Logical Drive of RAID6 with three Hard Disk Drives, you need to use WebBIOS.

IMPORTANT: WebBIOS does not support the RAID6 logical drive having Stripe Size: 8KB composed of three Hard Disk Drives.

Chapter 5

Installing the Operating System

Refer to the User's Guide of your CPU Blade for how to install the operating system.

INSTALLING AND SETTING DEVICE DRIVERS

Follow these steps to install and configure the device drivers.

> **NOTE:** You may need an optical disk drive to setup the device driver. Refer to the User's Guide of optical disk drive for how to use the drive. (The optical disk drive equipped on Blade Enclosure is also available.)

Installing Internal RAID Controller Driver

Refer to the User's Guide of CPU Blade to install the driver.

PROSet

PROSet is a utility that confirms the network features contained in network driver.

Using PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnosis including loop back test, packet transmission test and so on.
- Setup of teaming.

> **NOTE:** All of the operation that related to device driver and Intel® PROSet must be executed with administrator privileges from the console connected to the CPU Blade. Operation by [Remote Desktop Connection] of OS or any other remote management tool is not supported.

Configuring several network adapters as one team provides the system a tolerant environment on any trouble and enhances throughput between the switches.

PROSet is necessary to use these features.

Refer to the User's Guide of CPU Blade to install PROSet.

Network Driver

Refer to the User's Guide of CPU Blade to install network driver of onboard network adapter.

> **IMPORTANT:** The setting change of the link speed of onboard network adapter (Intel(R) 82576 Gigabit Dual Port Server Network Connection]/[Intel(R) 82576 Gigabit Dual Port Server Network Connection #2] is not supported. Please do not change setting of the link speed.

Optional Network Board Driver

To use an optional Network Board (N8403-017/020/021/022), install the driver according to the User's Guide of CPU Blade.

Setup of Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Refer the CPU Blade User's Guide to setup Teaming and removing Team of onboard network adapter or optional network board.

Setting WOL

The Storage and I/O Blade does not support WOL (Wake On Lan) feature.

Setting Receive Side Scaling

The setting for Receive Side Scaling must be changed on the onboard network adapter and optional network board (N8403-017/020/021/022). Follow steps below.

> **NOTE:** This is common procedure for all Windows OS.

> **IMPORTANT:** With Windows Server 2003 64-bit (x64) Edition / Windows Server 2003 32-bit (x86) Edition, setup Receive Side Scaling before installing Intel® PROSet.

1. On the CPU Blade, open the [Device Manager].
2. Open the property of [Intel(R) PRO/1000…] under [Network Adapter] tree.
3. Click [Advanced] tab.
4. Change setting of the [Receive Side Scaling] to "Disabled".
5. Click [OK].
6. Reboot the system.

> **IMPORTANT:** If [Receive Side Scaling] is not displayed on Windows Server 2003 64-bit (x64) Edition / Windows Server 2003 32-bit (x86) Edition, uninstall Intel® PROSet according to [Uninstall Intel® PROSet]. Set the [Receive Side Scaling] in above procedure.
> When re-install Intel® PROSet, refer to "PROSet".

Uninstallation of Intel® PROSet

1. On the CPU Blade, open the [Control Panel].
2. Double click [Add or Remove Programs].
3. Select [Intel(R) PRO Network…], and click [Change/Remove].
4. When [Intel(R) PRO Network Connections] dialog appears, make sure that the following three items are checked. Then, click [Remove].
   - Driver
   - Intel(R) PROSet for Windows* Device Manager
   - Advanced Network Services
5. When the dialog appears, click [Yes].

   Uninstallation starts.
6. Click [Finish].

Setting up Scalable Networking Pack (SNP)

Microsoft Windows Server 2003 Scalable Networking Pack (SNP) is a module that improves network throughputs by offloading the packet processing to the specific network adapter.

SNP supports the following operating systems:

- Windows Server 2003 x64 Editions
- Windows Server 2003

SNP has the following features:

- TCP Chimney Offload

  TCP Chimney Offload feature can reduce the CPU overhead by offloading networking tasks such as packet division and packet reconstruction to the network adapter.

- Receive-side Scaling

  Receive-side Scaling enables packet receive-processing to scale with the number of available CPUs. The network processing load is balanced between the CPUs.

- NetDMA

  Normally, the memory transfer operation of network data is performed by the CPU. Using DMA (Direct Memory Access) of the network adapter for that process can reduce CPU utilization.

IMPORTANT: The onboard network adapter and optional network board (N8403-017/020/021/022) do not support TCP Chimney Offload feature.

NOTE: Download Microsoft Windows Server 2003 Scalable Networking Pack from the following web site:
http://nec8.com/

Follow steps below to use SNP.

IMPORTANT: It is recommended to make a backup copy of system configuration data before starting setup.

1. Start the system and log-in the system in account with the administrator authority.
2. Run the following command on Explorer or command prompt:
   - Windows Server 2003:
     WindowsServer2003-KB912222-v9-x86-JPN.exe
   - Windows Server 2003 x64 Editions:
     WindowsServer2003.WindowsXP-KB912222-v9-x64-JPN.exe
3. If a Security Alert appears, click [Run].
4. Unzip the file and click [Next].

5. [Agree Software License Agreement] screen appears.

   Read the license terms carefully. If you agree, select "I accept the license terms", and then click [Next].

   Installation starts by copying files. After a while, [Setup Wizard Completed] dialog appears.

6. Click [Finish].

7. Reboot the system.

You can check if SNP has been successfully installed or not by running [Add or Remove Programs] and view "Hotfix for Windows Server 2003 (KB912222)" is contained in the list.

If you want to restore the system to that before installing SNP, uninstall SNP in the following procedure.

> **IMPORTANT:** If any other modules (e.g., Update media, Service Pack, and/or security patch) is applied after SNP has been installed, first uninstall such modules before uninstalling SNP.

1. Log-in the system in account with the administrator authority.

2. Run [Add or Remove Programs].

3. Select the following item and click [Remove].

   "Hotfix for Windows Server 2003 (KB912222)"

4. On the [Software Update Installation Wizard] dialog, click [Next].

   Uninstallation of KB912222 starts. After a while, [Software Update Installation Wizard Completed] dialog appears.

5. Click [Finish].

6. Reboot the system.

Installing Fibre Channel Controller Driver (N8403-018)

Refer to the User's Guide of CPU Blade to install the driver.

SETTING FOR SOLVING PROBLEMS

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

Network Monitor

Microsoft Network Monitor allows you to examine and troubleshoot network problems.

Network Monitor Setup (Windows Server 2008)

> **NOTE:** Windows Server 2008 does not provide Network Monitor. To use Network Monitor on Windows Server 2008, install Network Monitor according to the steps below.

1. Download Microsoft Network Monitor from the following web site:
   http://support.microsoft.com/kb/955998/en-us
2. Run the downloaded file to start the installer.

   Follow the on-screen instructions to install Network Monitor.

   > **NOTE:** If a Security Alert appears, click [Run]. Select [Complete] for a setup format.

3. Network Monitor is installed.

   > **NOTE:** To remove Network Monitor, go to [Programs and Features].

Network Trace Capture (Windows Server 2008)

1. On the Start menu of the CPU Blade, start Microsoft Network Monitor.
2. On [Start Page], select [Create a new capture tab...] or select [New] in the [File] menu, and click [Capture...].

   A new tab for capturing a network trace is created.
3. On the [Select Networks] window, select a network you want to capture a trace.
4. On the [Capture] menu, click [Start] to start capturing a network trace.
5. On the [Capture] menu, click [Stop] to stop capturing a network trace.
6. On the [File] menu, select [Save As...].

   The [Save As] window appears. Select [All captured frames] from [Frame selection], and enter the names of a folder and a file appropriately.

   The following folder is specified by the default setting.

   C:\Users\<User name>\Documents\Network Monitor 3\Captures
7. Click [Save].

   A file is created in the folder specified in step 6.

Network Monitor (Windows Server 2003)

To use Network Monitor, you need to restart the system after the installation has completed, so we recommend you to install Network Monitor before any network trouble occurs.

1. Point to [Settings] from Start menu of the CPU Blade, and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Add or Remove Programs].

   The [Add or Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

   The [Windows Components Wizard] dialog box appears.

4. Click [Management and Monitoring Tools] and then click [Details].

   The [Management and Monitoring Tools] dialog appears.

5. Click to select the [Network Monitor Tools] check box, and then click [OK].

6. The [Windows Components Wizard] dialog box appears again, so click [Next].

7. If the setup asks to install the disk, insert the OS CD-ROM into optical disk drive and click [OK].

   NOTE: You will be prompted to insert a disk labeled "Service Pack 1 CD-ROM". However, if you are using Windows Server 2003 R2, insert "Windows Server 2003 R2 DISC 1" into the optical disk drive.

8. Click [Finish] in the [Windows Component Wizard] dialog box.

9. Close the [Add or Remove Programs] dialog box.

10. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Start] → [Program] → [Administrative Tools] and click [NetworkMonitor]. For information on how to operate Network Monitor, refer to Online Help.

UPDATING THE SYSTEM

Use NEC EXPRESSBUILDER DVD that comes with your CPU blade to update the system. Refer to the User's Guide of CPU blade for details.

Execute "Updating the System" in following cases.

- CPU is expanded (changed from single processor to multi-processor).
- Performed setup again.
- Modified system configuration (installed/removed internal option devices).
- Recovered the system using recovery process.
- Restored the system using the backup tool.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

It is recommended to make a backup copy of the system information using the NEC EXPRESSBUILDER DVD that comes with your CPU Blade, after completing the system setup.

Without the backup data, you will be unable to restore the configuration data and specific information for the system. You can save the information by the following process.

1. Prepare one 3.5-inch floppy disk.
2. Connect the external floppy disk drive to the Blade Enclosure according to the User's Guide of Blade Enclosure. Or, connect the external floppy disk drive to K410-150(00) SUV cable.
3. Insert the "NEC EXPRESSBUILDER" DVD into the optical disk drive of the CPU Blade and reboot the system.

   For the subsequent steps, refer to the manual of your CPU Blade to make a backup copy of the system information by using the System Information Management feature of Maintenance Tools.

Chapter 6

Installing and Using Utilities

Refer to the User's Guide of the CPU Blade contained in the NEC EXPRESSBUILDER DVD for information about utilities provided for the CPU Blade and Storage and I/O Blade.

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Chapter 7

Maintenance

This chapter describes the daily maintenance of the system and precautions when relocating or storing the Storage and I/O Blade.

MAKING BACKUP COPIES

NEC recommends you make backup copies of your valuable data stored in hard disk drives of the Storage and I/O Blade on a regular basis. For backup storage devices suitable for the Storage and I/O Blade and backup tools, consult with your service representative.

When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the CPU blade and Storage and I/O Blade.

Select [Tool menu] - [Test and diagnostics] in the NEC EXPRESSBUILDER provided with the CPU blade to diagnose the system.

Test Items

The following items are tested in system diagnostics.

- Memory installed in CPU blade
- CPU cache memory
- Hard disk drive used as a system

IMPORTANT: When executing the System Diagnostics, make sure to disconnect the target CPU blade and Storage and I/O Blade from the network. Executing the System Diagnostics with the CPU blade and Storage and I/O Blade being connected to the network, the network may be influenced.

NOTE: On checking the hard disk drive, no data is written into the disk.

Startup and Exit of System Diagnostics

There are two ways to diagnose the system: to use the local console (keyboard) connected to the Blade Enclosure, and to use the management PC via serial port (remote console).

Refer to the User's Guide of the CPU blade for how to perform system diagnostics.

RELOCATING/STORING THE UNIT

Follow the procedure below to relocate or store the Storage and I/O Blade, hard disk drives, and Blade Enclosure:

⚠ WARNING

Observe the following instructions to use the Storage and I/O Blade safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-6 for details.

- Do not disassemble, repair, or alter the device.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the device.

⚠ CAUTION

Observe the following instructions to use the Storage and I/O Blade safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-6 for details.

- Never attempt to lift the unit with three or less persons.
- Do not install the unit in any place other than specified.
- Do not connect/disconnect any interface cable with the power cord of the unit plugged to a power source.

IMPORTANT:

- If the Storage and I/O Blade needs to be relocated/stored due to a change in the floor layout to a great extent, contact your service representative.
- Be sure to make a backup copy of your valuable data in the hard disk drive, if any.
- Be sure not to apply a shock to hard disk drives to relocated the Storage and I/O Blade if the contains any.
- It is recommended that the Storage and I/O Blade and the internal devices should be stored in a place where the room temperature can be maintained. It is important for the Storage and I/O Blade or internal devices to work normally after storage. Store the device in the place where temperature ranges between -10 to 55°C and humidity ranges between 20 to 80%, without dew condensation.

Relocating/Storing Blade Enclosure with Devices Installed

1. Turn off the powers of all the CPU blades and Storage and I/O Blade in Blade Enclosure.
2. Turn off the power of Blade Enclosure.
3. Unplug the power cord of Blade Enclosure from the power receptacle.
4. Remove all the cables from CPU blades, Storage and I/O Blade, and other devices.
5. Take out the Blade Enclosure from the rack with four or more persons.
6. Hold the handles and carry the Blade Enclosure with four or more persons
7. Protect the Blade Enclosure with the shock-absorbing materials, and pack it securely.

Relocating/Storing a Device in Blade Enclosure

Remove the device from Blade Enclosure according to Chapters 3 and 9. Protect the device with the shock-absorbing materials, and pack it securely.

IMPORTANT: The Storage and I/O Blade or internal option device may be dewed if it is brought to a warm place from a cold place suddenly. Using a Storage and I/O Blade or an internal device with dew attached may cause malfunction or failure.
Make sure to adapt them to the operating environment before using them.

Chapter 8

Troubleshooting

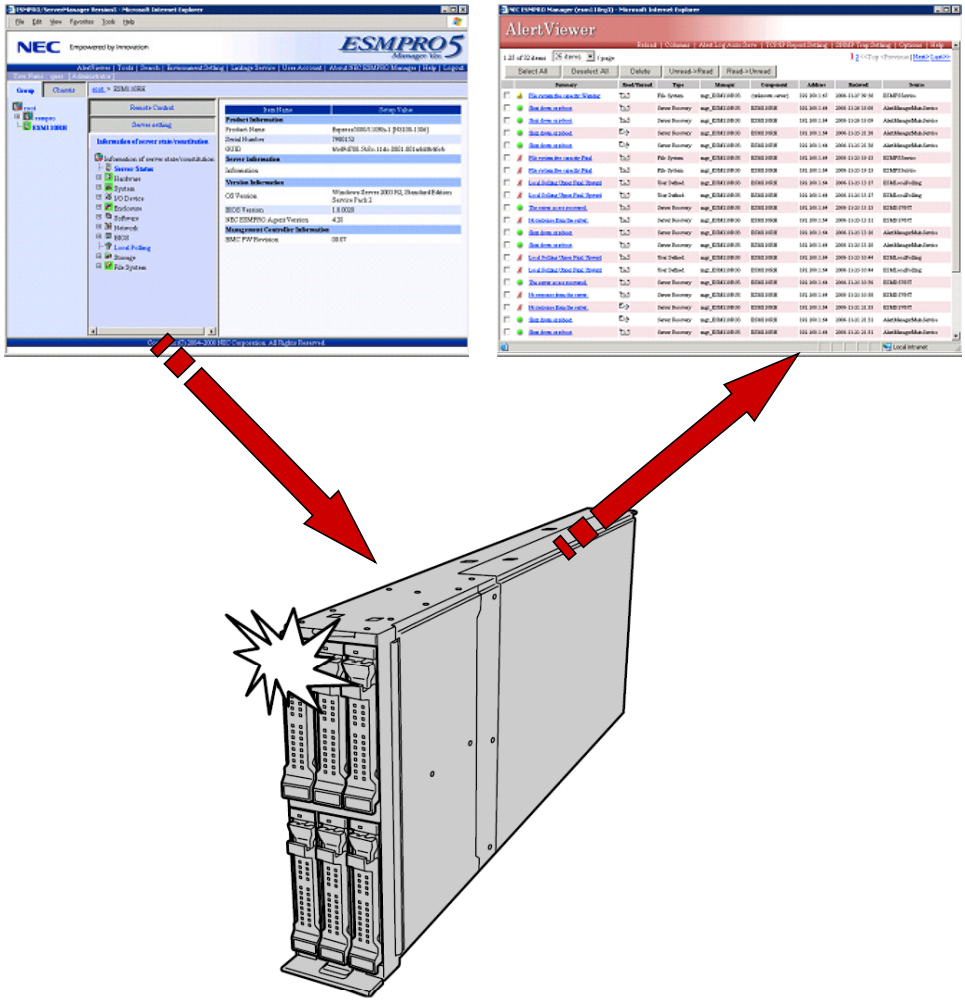
If your CPU blade and Storage and I/O Blade do not operate as expected, read this chapter before assuming a failure.

SYSTEM VIEWERS

Monitor the occurrence of fault by NEC ESMPRO and Web console of EM card during the system operation.

Check whether any alert is reported on NEC ESMPRO Manager and Web console of EM card.

[Example]



NOTE: To monitor the occurrence of fault by NEC ESMPRO, the EM card in Blade Enclosure must be associated with NEC ESMPRO. For more information, refer to the User's Guide of EM card.

ERROR MESSAGES

If an error occurs in the Storage and I/O Blade, an error message appears on the display unit.

POST Error Messages

Powering on the CPU blade automatically starts the self-diagnostic program, POST (Power On Self-Test). When the POST detects any error, it displays an error message and its measure on the display unit.

Refer to the User's Guide of your CPU blade for POST error messages.

Messages displayed by RAID Controller during POST

On-screen message	Action
Memory/battery problems were detected. The adapter has recovered, but cached data was lost. Press any key to continue, or 'C' to load the configuration utility.	Contact your service representative.
Firmware version inconsistency was detected. The adapter has recovered, but cached data was lost. Press any key to continue, or 'C' to load the configuration utility.	Contact your service representative.
Foreign configuration(s) found on adapter Press any key to continue, or 'C' to load the configuration utility.	Press **C** to run the utility to import or clear configuration.
Previous configuration cleared or missing Importing configuration created on MM/DD hh:mm Press any key to continue, or 'C' to load the configuration utility.	Contact your service representative.
An enclosure was found that contains both SAS and SATA drives, but this controller does not allow mixed drive types in a single enclosure. Please correct the problem then restart your system. Press any key to continue, or 'C' to load the configuration utility.	RAID Controller may be faulty. Contact your service representative to replace the RAID Controller.
SAS drives were detected, but this controller does not support SAS drives. Please remove the SAS drives then restart your system. Press any key to continue, or 'C' to load the configuration utility.	RAID Controller may be faulty. Contact your service representative to replace the RAID Controller.

On-screen message	Action
SATA drives were detected, but this controller does not support SATA drives. Please remove the SATA drives then restart your system. Press any key to continue, or 'C' to load the configuration utility.	RAID Controller may be faulty. Contact your service representative to replace the RAID Controller.
Invalid SAS topology detected. Please check your cable configurations, repair the problem, and restart your system.	Check if cable is connected properly. If the same error persists, contact your service representative.
The battery hardware is missing or malfunctioning, or the battery is unplugged, or the battery could be fully discharged. If you continue to boot the system, the battery-backed cache will not function. If battery is connected and has been allowed to charge for 30 minutes and this message continues to appear, then contact technical support for assistance. Press 'D' to disable this warning (if your controller does not have a battery).	Check if battery for RAID Controller is connected properly. If the same error persists, contact your service representative.
Your VDs that are configured for write-back are temporarily running in write-through mode. This is caused by the battery being charged, missing, or bad. Please allow battery to charge for 24 hours before evaluating battery for replacement. The following VDs are affected : XX Press any key to continue.	Run WebBIOS or Universal RAID Utility to check if battery for RAID Controller is detected. • Battery is not detected: – Check if battery is connected properly. – Battery may be insufficiently charged. Halt the system for 24 hours or longer and charge battery. • Battery is detected: – Halt the system for 9 hours or longer and charge battery. If the same error persists, contact your service representative.
Invalid SAS Address present in MFC data. Please program valid SAS Address, and restart your system.	Contact your service representative.
Some configured disks have been removed from your system, or are no longer accessible. Please check your cables and also ensure all disks are present. Press any key to continue, or 'C' to load the configuration utility.	Check if cable and hard disk drives are connected properly. If the same error persists, contact your service representative.
The following VDs have missing disks: xx If you proceed (or load the configuration utility), these VDs will be marked OFFLINE and will be inaccessible. Please check your cables and ensure all disks are present. Press any key to continue, or 'C' to load the configuration utility.	

On-screen message	Action
The following VDs are missing: xx If you proceed (or load the configuration utility), these VDs will be removed from your configuration. If you wish to use them at a later time, they will have to be imported. If you believe these VDs should be present, please power off your system and check your cables to ensure all disks are present. Press any key to continue, or 'C' to load the configuration utility.	Check if cable and hard disk drives are connected properly. If the same error persists, contact your service representative.
All of the disks from your previous configuration are gone. If this is an unexpected message, then please power off your system and check your cables to ensure all disks are present. Press any key to continue, or 'C' to load the configuration utility.	
The cache contains dirty data, but some VDs are missing or will go offline, so the cached data can not be written to disk. If this is an unexpected error, then please power off your system and check your cables to ensure all disks are present. If you continue, the data in cache will be permanently discarded. Press 'X' to acknowledge and permanently destroy the cached data.	Check if cable and hard disk drives are connected properly. If the same error persists, contact your service representative. NOTE: If you press **X**, the data in cache memory will be lost.
Invalid memory configuration detected. Please contact your system support. System has halted.	Contact your service representative to replace the RAID Controller.
RAID Adapter FW Failed Validation!!! Adapter needs to be reflashed. Press any key to continue.	Contact your service representative to replace the RAID Controller.
Cache data was lost due to an unexpected power-off or reboot during a write operation, but the adapter has recovered. This could be due to memory problems, bad battery, or you may not have a battery installed. Press any key to continue or 'C' to load the configuration utility.	Check if battery for RAID Controller is connected properly. If the same error persists, contact your service representative to replace the RAID controller and battery for RAID Controller.
Entering the configuration utility in this state will result in drive configuration changes. Press 'Y' to continue loading the configuration utility or please power off your system and check your cables to ensure all disks are present and reboot.	Check if hard disk drives are connected properly. If the same error persists, contact your service representative.
Multibit ECC errors were detected on the controller. DIMM on the controller needs replacement. If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.	Contact your service representative to replace the RAID Controller.

On-screen message	Action
Multiple Single-bit ECC errors were detected during the previous boot of the controller. DIMM on the controller needs replacement. If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.	Contact your service representative to replace the RAID Controller.
Single-bit overflow ECC errors were detected during the previous boot of the controller. DIMM on the controller needs replacement. If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.	Contact your service representative to replace the RAID Controller.

Lamps

The Storage and I/O Blade, the drive carrier (hard disk drive), and the Blade Enclosure include lamps to indicate the device status by a variety of colors and display patterns. See Chapter 2 for locations of lamps and their indications.

Error Messages on Virtual LCD

The virtual LCD displays the error occurred during operation or DC OFF (AC power is being on). The following table lists indications on virtual LCD, descriptions, and actions to take.

The Web console of the Blade Enclosure displays the status of the managed Storage and I/O Blade on virtual LCD (16 digits x 2 lines). Refer to the User's Guide of EM card for how to use Web console.

IMPORTANT:

- Take a note on the messages displayed on virtual LCD before consulting with your service representative. Alarm messages are useful information for maintenance.
- IPMI information is also useful for maintenance. Refer to the User's Guide of CPU blade for how to collect IMPI information.

Virtual LCD indications when STATUS lamp is flashing in red

On-screen message	Description	Action
MEZ1 Power Fault	An error was detected in power circuit of mezzanine card installed in Type 1 slot of Storage and I/O Blade.	Check installation status of mezzanine card. If the same error persists, contact your service representative.
MEZ2 Power Fault	An error was detected in power circuit of mezzanine card installed in Type 2 slot of Storage and I/O Blade.	
AmbientTempAlm09	A high temperature error was detected in Storage and I/O Blade.	Check if fans in Blade Enclosure work normally. Refer to the User's Guide of the Blade Enclosure to make sure that the sufficient number of fans are installed in correct locations. Check if the fans and Storage and I/O Blade are installed in correct locations. Check if the ambient temperature of installation location satisfies the operation guarantee condition. If the same error persists, contact your service representative.
AmbientTempAlm02	A low temperature error was detected in Storage and I/O Blade.	Check if the ambient temperature of installation location satisfies the operation guarantee condition. If the same error persists, contact your service representative.
BB +1.0v Alm XX BB +3.3v Alm XX BB +5v Alm XX BB +0.9vs Alm XX BB +1.0vs Alm XX BB +1.8vs Alm XX BB +3.3vs Alm XX BB +5vs Alm XX BB +12vs Alm XX Battery Alm XX	A voltage alarm was detected in Storage and I/O Blade. XX=09: Upper limit alarm XX=02: Lower limit alarm	Contact your service representative.

Virtual LCD indications when STATUS lamp is flashing in amber

On-screen message	Description	Action
HDD X Fault	An error was detected in hard disk drive installed in Storage and I/O Blade. X: Indicates slot number containing the failing hard disk drive with 0-origin number.	Contact your service representative.
E-Keying Error	In the Blade Enclosure, combination of installation locations of Storage and I/O Blade, mezzanine card, and switch module is not correct. Thus, an unconformity of interface signal was detected and the CPU blade failed to power on.	Refer to the User's Guide of Blade Enclosure for correct installation locations. If the same error persists, contact your service representative.
Location Error	In the Blade Enclosure, the installation location of Storage and I/O Blade is incorrect, or the installation locations of the fan and Storage and I/O Blade are incorrect. Thus, the CPU blade failed to power on.	Refer to the User's Guide of Blade Enclosure to check if the Storage and I/O Blade is installed in correct location. Check the installation locations of the fan and Storage and I/O Blade. If the same error persists, contact your service representative.
Cooling Error	In the Blade Enclosure, the number of fans installed is insufficient or the installed fan is faulty. Thus, the CPU blade failed to power on due to insufficient cooling power.	Check if fans in Blade Enclosure work normally. Refer to the User's Guide of the Blade Enclosure to make sure that the sufficient number of fans are installed in correct locations. Check if the fans and Storage and I/O Blade are installed in correct locations. Check if the ambient temperature of installation location satisfies the operation guarantee condition. If the same error persists, contact your service representative.
AmbientTempAlm07	A high temperature warning was detected in Storage and I/O Blade.	
AmbientTempAlm00	A low temperature warning was detected in Storage and I/O Blade.	
BB +1.0v Alm XX BB +3.3v Alm XX BB +5v Alm XX BB +0.9vs Alm XX BB +1.0vs Alm XX BB +1.8vs Alm XX BB +3.3vs Alm XX BB +5vs Alm XX BB +12vs Alm XX Battery Alm XX	A voltage warning was detected on Storage and I/O Blade. XX=07: Upper limit warning XX=00: Lower limit warning	Contact your service representative.

SOLVING PROBLEMS

When the CPU blade or Storage and I/O Blade fails to operate as expected, see the following to find out your problem and follow the instruction given before asking for repair.

If the CPU blade or Storage and I/O Blade still fails to operate successfully after solving your problem, take a note on the on-screen message and contact your service representative.

Storage and I/O Blade

Fail to power-on:

- ❑ Is the proper power supplied to the system?

  → Make sure that the power cord is connected to an AC outlet (or UPS) meeting the power standard of the Blade Enclosure.

  → Use the power cord shipped with the Blade Enclosure. In addition, make sure that the outer cover of the power cord is not broken and the cord at the plug is not bent.

  → Make sure that the breaker of the connected outlet is set to ON.

  → If the power cord is connect to the UPS, make sure that the power of the UPS is set to ON and proper power is output from the UPS. Refer to the manual shipped with the UPS for details.

  → Make sure that the CPU blade connected with Storage and I/O Blade is installed correctly.

  The CPU blade BIOS SETUP utility allows you to set the feature for power link with the UPS.

  <Menus to check: [AC-LINK] in [Server] menu>

- ❑ Does the Blade Enclosure contain the required number of power units?

  → Refer to the User's Guide of Blade Enclosure for the required number of power units.

- ❑ Has the EM card been initialized?

  → If the EM card is not initialized, the power unit does not supply the power to the CPU blade and Storage and I/O Blade.

- ❑ Does the Blade Enclosure contain the required number of fans in proper location?

  → Refer to the User's Guide of Blade Enclosure for the required number of fans and their installation locations.

- ❑ Have the CPU blade (containing mezzanine card), Storage and I/O Blade (containing mezzanine card), and switch modules been installed in proper position?

  → See Chapter 9 or refer to the User's Guide of Blade Enclosure for proper installation locations.

- ❑ Did you turn on the power of Blade Enclosure and Storage and I/O Blade within 30 seconds after AC power is supplied to each power unit?

  → Initialization of BMC takes about 30 seconds after AC power is supplied to the CPU blade and Storage and I/O Blade. After making sure that the AC power is supplied to the CPU blade and Storage and I/O Blade (the POWER lamp lit amber), wait for 30 seconds or longer, then turn on the power of Blade Enclosure by using the POWER switch.

- ❑ Immediately after the power is supplied to the CPU blade and Storage and I/O Blade, the power-on of CPU blade and Storage and I/O Blade in the slot having the larger number is delayed.

  → Initialization of BMC is performed for about 30 seconds after power-on of CPU blade and Storage and I/O Blade. After that, the CPU blades and Storage and I/O Blades are powered on sequentially. At power-on sequence, a waiting time {(slot number - 1) × 2 seconds} is inserted between blades. Accordingly, the power-on of CPU blade and Storage and I/O Blade in the slot having the larger number is delayed.

- ❑ It occasionally takes time from power-on operation to CPU blade to turning on the Storage and I/O Blade.

  → When power-on operation for CPU blade is executed, the CPU blade notifies the EM card of it, and wait for permission. Upon getting permission, the power-on for Storage and I/O Blade is executed. If the EM card is processing other task and it is busy, permission for power-on is delayed.

The remote power-on through network does not work (Wake On LAN does not work):

- ❑ Does the LAN port support Wake on LAN featuer?

  → Storage and I/O Blade (containing mezzanine card) does not support Wake on LAN feature.

Fail to power-off:

- ❑ Did you turn off the power of CPU blade?

  → The power of Storage and I/O Blade is linked with the power of the CPU blade and controlled by EM card. Turn off the power of CPU blade.

- ❑ Is the POWER switch function of the CPU blade disabled?

  → Restart the CPU blade once and then start the BIOS SETUP utility.

  <Menus to check: [Security] – [Power Switch Inhibit]>

The MAC address of the LAN of the Storage and I/O Blade is unknown:

→ You can find the MAC address by the label put near the MP connector on the Storage and I/O Blade. See Chapter 3 for details.

Fail to access to internal or external devices (or such devices fail to operate):

- ❑ Are cables properly connected?

  → Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.

- ❑ Is the power-on order correct?

  → When the CPU blade has any external devices connected, power on the external devices first, then the CPU blade and Storage and I/O Blade.

- ❑ Did you install drivers for connected optional devices?

  → Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

- ❑ Is BIOS configuration of CPU blade correct?

  → When the CPU blade has PCI devices connected, make sure to set the PCI device interrupt and others with the BIOS SETUP utility of the CPU blade. (Most PCI devices generally do not require any change to the configuration, but some boards do require specific settings. Refer to the manual that comes with the board for details to make correct settings.

Fail to access the hard disk drive:

- ❑ Is the hard disk drive applicable to the CPU blade and Storage and I/O Blade?

  → Operation of any device that is not authorized by NEC is not guaranteed.

- ❑ Is the hard disk drive properly installed?

  → Securely insert the drive carrier into the Storage and I/O Blade and lock it with the lever. The hard disk drive is not connected to the internal connector when it is not completely installed.

Fail to start OS:

- ❑ Is the BIOS configuration of CPU blade correct?

  → Run the BIOS SETUP utility of CPU blade to change the boot order.

  <Menu to check: [Boot]>

- ❑ Is a floppy disk contained in the floppy disk drive?

  → Take out the floppy disk and restart the CPU blade.

- ❑ Is the OS broken?

  → Use recovery process to recover the system.

  Refer to the documentation stored in NEC EXPRESSBUILDER that comes with the CPU blade.

The system does not restart automatically when a stop error occurs, though the system is adjusted to automatically restarting:

→ When the system does not restart automatically, restart it manually.

The CPU blade is not found on the network:

- ❑ Is the LAN cable connected?

  → Make sure the connection of network cable. Also make sure that the LAN cable to use conforms to the network interface standard.

- ❑ Is BIOS configuration correct?

  → The internal LAN controller may be disabled with the BIOS SETUP utility of the CPU blade. Check the setting with the BIOS SETUP utility.

- ❑ Have the protocol and service already been configured?

  → Install the distinctive network driver for the CPU blade. Make sure that the protocol, such as TCP/IP, and services are properly specified.

- ❑ Is the transfer speed correct?

  → The internal LAN controller of Storage and I/O Blade works on network with transfer rate of 1Gps. Open the network property dialog box in control panel to specify the "Link Speed" value the same as the value specified for HUB.

Problems with Windows

The following system events are logged when Windows Server 2008 is installed:

Event ID: 134
Source: Microsoft-Windows-Time-Service
Level: Warning
Description: NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on 'time.windows.com,0x9'. NtpClient will try again in 15 minutes and double the reattempt interval thereafter.
The error was: No such host is known. (0x80072AF9)

Event ID: 263
Source: PlugPlayManager
Level: Warning
Description: The service 'ShellHWDetection' may not have unregistered for device event notifications before it was stopped.

Event ID: 7000
Source: Service Control Manager
Level: Error
Description: The Parallel port driver service failed to start due to the following error: The service cannot be started, either because it is disabled or because it has no enabled devices associated with it.

Event ID: 15016
Source: Microsoft-Windows-Http
Level: Error
Description: Unable to initialize the security package Kerberos for server side authentication. The data field contains the error number.

→ These events do not affect system operation. Ignore these messages.

The following application events are logged when Windows Server 2008 is installed.

Event ID: 63
Source: Microsoft-Windows-WMI
Level: Warning
Description: A provider, Ncs2, has been registered in the Windows Management Instrumentation namespace Root\cimv2 to use the LocalSystem account.
This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

A provider, IntelEthernetDiag, has been registered in the Windows Management Instrumentation namespace Root\CIMv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

A provider, WmiPerfClass, has been registered in the Windows Management Instrumentation namespace root\cimv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

→ These events do not affect system operation. Ignore these messages.

There are some cases that an event log is registered as follows at the start of Windows Server 2008 64-bit (x64) Edition / Windows Server 2008 32-bit (x86) Edition:

Event ID: 11
Source: iANSMiniport
Level: Warning
Description: Adapter link down: Intel(R) ~

Event ID: 13
Source: iANSMiniport
Level: Warning
Description: Intel(R)~ has been deactivated from the team.

Event ID: 16
Source: iANSMiniport
Level: Warning
Description: [Team Name]: The last adapter has lost link. Team network connection has been lost.

Event ID: 22
Source: iANSMiniport
Level: Warning
Description: Primary Adapter does not sense any Probes:
Intel(R) ---- Possible reason: partitioned Team.

→ If you have created a team of network adapters, the above events may be logged when you start the system. These events do not affect the LAN driver operation. Ignore these messages.

The following system event is logged when Windows Server 2008 is installed.

Event ID: 10

Source: VDS Dynamic Provider

Description: The provider failed while storing notifications from the driver. The Virtual Disk Service should be restarted. hr=80042505

→ Go to the Microsoft website: http://support.microsoft.com/kb/948275/en-us/

The following system events are logged when Windows Server 2008 is installed.

Event ID: 1021

Source: Microsoft-Windows-Security-Licensing-SLC

Level: Warning

Description: SLUINotify service has failed to start. hr=0x80070424

→ Perform procedure for license authentication. Refer to "Windows Server 2008 Installation Supplement Guide" for details.

Event ID: 1534

Source: Microsoft-Windows-User Profiles Service

Level: Warning

Description: Profile notification of event Create for component {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is -2147023591.

→ This event does not affect system operation. Ignore these messages.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions:

Source: LoadPerf

Category: Error

Event ID: 3009

Description: Installing the performance counter strings for service C:\WINDOWS\syswow64\ipsecprf.ini (C:\WINDOWS\syswow64\ipsecprf.ini) failed. The Error code is the first DWORD in Data section.

→ It is not a problem in operating the system.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions:

Source: DCOM
Category: Error
Event ID: 10016
Description: The application-specific permission settings do not grant Local Activation permission for the COM server application with CLSID {555F3418-D99E-4E51-800A-6E89CFD8B1D7} to the user {NT AUTHORITY\LOCAL SERVICE} SID {S-1-5-19}.
This security permission can be modified using the component Services administrative tool.

→ It is not a problem in operating the system.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions:

Source: WinMgmt
Category: Warining
Event ID: 5603
Description: A provider, Rsop Planning Mode Provider, has been registered in the WMI namespace, root\RSOP, but did not specify the HostingModel property. This provider will be run using the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. Ensure that provider has been reviewed for security behavior and update the HostingModel property of the provider registration to an account with the least privileges possible for the required functionality.

→ It is not a problem in operating the system.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions:

Source: WinMgmt
Category: Warining
Event ID: 63
Description: A provider, HiPerfCooker_v1, has been registered in the WMI namespace, Root\WMI, to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
A provider, WMIProv, has been registered in the WMI namespace, Root\WMI, to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

→ It is not a problem in operating the system.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions.

Source: Service Control Manager
Type: Error
Event ID: 7011
Description: Timeout (30000 milliseconds) waiting for a transaction response from the Dfs service.

→ When this event is not registered by rebooting the system, it is not a problem in operating the system.

There are some cases that an event log is registered as follows at the start of Windows Server 2003 x64 Editions / Windows Server 2003:

Event ID: 11
Source: iANSMiniport
Level: Warning
Description: Adapter link down: Intel(R)PRO/1000 ~

Event ID: 13
Source: iANSMiniport
Level: Warning
Description: Intel(R)PRO/1000 ~ has been deactivated from the team.

Event ID: 16
Source: iANSMiniport
Level: Warning
Description: [Team Name]: The last adapter has lost link. Team network connection has been lost.

Event ID: 22
Source: iANSMiniport
Level: Warning
Description: Primary Adapter does not sense any Probes:
Intel(R)PRO/1000 ---- Possible reason: partitioned Team.

→ If you have created a team of network adapters, the above events may be logged when you start the system. These events do not affect the LAN driver operation.

While installing Windows Server 2003 R2, applied Service Pack before installing Windows Server 2003 R2 DISC 2:

→ After Windows Server 2003 R2 has been installed, apply Service Pack again by "Updating the System".

There are some cases that an event log is registered as follows when you operate Windows Server 2003 R2.

Source: IPMIDRV

Type: Error

Event ID: 1001

Description: The IPMI device driver attempted to determine if the system supported an IPMI BMC device. The driver attempted to detect the presence of the IPMI BMC by searching the SMBIOS for Type 38 record. But either no record was found or the record was not compatible with the version of the device driver. If a SMBIOS Type 38 record was detected, the Dump Data field of the event contains a binary representation of the record.

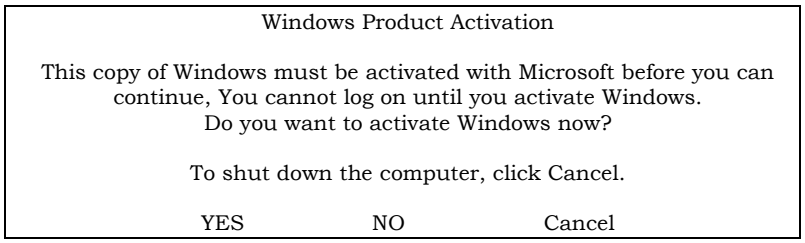
→ If you use "Hardware Management" which is provided by Windows Server 2003 R2, above-shown event log will be registered.

For more details, refer to "Enabling Microsoft Windows Server 2003 R2 Hardware Management" on the following site.

[NEC Express5800 Web Site]
http://www.nec.co.jp/express/download/W2K3_R2

The system displays the message below and fails to log in.

→ In Windows Server 2003, the following message will be displayed if you use the operating system without executing the license authentication. Select "Yes", and execute the procedure for license authentication.


Windows Product Activation
This copy of Windows must be activated with Microsoft before you can continue, You cannot log on until you activate Windows.
Do you want to activate Windows now?
To shut down the computer, click Cancel.
YES
NO
Cancel

Fail to start the OS with the /3GB switch:

→ System often fails to start the OS with the /3GB switch.

In this case, please adjust the capacity of the user mode area using the /userva switch in reference to the following URL.

http://support.microsoft.com/kb/316739/en

Problems with RAID System and RAID Controller

Fail to install the OS:

- ❑ Did you create virtual disk?

  → Create virtual disks by using WebBIOS.

Fail to start the OS:

- ❑ Are hard disk drives properly installed?

  → Install them properly.

  If the same error persists, the hard disk drive or RAID Controller may be faulty. Contact your service representative.

A hard disk drive fails:

→ Contact your service representative.

Rebuild fails:

- ❑ Is the capacity of the hard disk drive to be rebuilt sufficient?

  → The hard disk drive to be rebuilt should have the same capacity of the failed had disk drive.

- ❑ Is RAID0 configured for virtual disk?

  → RAID0 has no data redundancy, therefore, Rebuild is disabled in the RAID0 configuration. Replace the failed hard disk drive, then create the virtual disk again.

Check Consistency fails:

- ❑ Is virtual disk "Degraded"?

  → Replace the failed hard disk drive with new one, then perform Rebuild.

- ❑ Is RAID0 configured for virtual disk?

  → RAID0 has no data redundancy, therefore, Check Consistency is disabled in the RAID0 configuration.

Cannot set Write-Back for cache mode:

→ The current cache mode of RAID controller is displayed on [Virtual Disks] - [Properties] - [Policies] - "Write". If additional battery is faulty or insufficiently charged, the cache mode is changed to "WThru (Write Through)" even if you specify "WBack (Write Back)". See Chapter 4 for details.

RAID battery is not detected, or POST displays the following message:

> The battery hardware is missing or malfunctioning, or the battery is unplugged, or the battery could be fully discharged. If you continue to boot the system, the battery-backed cache will not function.
> If battery is connected and has been allowed to charge for 30 minutes and this message continues to appear, then contact technical support for assistance.
> Press 'D' to disable this warning (if your controller does not have a battery).

- ❑ Are cables connected properly?

  → Check connection between RAID battery and RAID Controller. If not, connect it properly.

- ❑ The RAID battery is not charged at shipment.

  → The RAID battery may not be detected if it is insufficiently charged. If the battery is not detected even after 24 hours, reboot the system.

  If the same error persists, the RAID battery may be faulty. Contact your service representative.

Event ID129:

The following message appears on Windows Event Log.

Source:	msas2k3
Event ID:	129
Type:	Warning
Description:	Information about Event ID (129) (Source: msas2k3) is not found. -----

→ Retry by OS has succeeded. It is not the problem in operating the system.

Event ID317:

The following message may be registered in RAID log in Universal RAID Utility and OS log (Event Log of Windows, syslog of Linux).

Source:	Raidsrv
Event ID:	317 (8000013D)
Type:	Warning
Description:	<RU0317>[CTRL: %1 PD:%2(%3) %4 %5] An error of warning level occurred on physical device. Error code: %6

→ Single-shot message indicates the successful retry even if the message above is registered. If this message is repeatedly registered, physical device may be faulty. Contact your service representative.

Event ID505:

The following message is registered in RAID log in Universal RAID Utility and OS log (Event Log of Windows, syslog of Linux).

Source:	raidsrv
Event ID:	505
Type:	Warning
Description:	<RU0505> [CTRL: RAID controller number] Temperature of battery is high.

If the event shown above is registered, check the current cache mode of RAID controller by using the Universal RAID Utility.

→ If the current cache mode is set to "Write Back", it is not the problem in operating the system.

→ If the current cache mode is set to "Write Through", the temperature of battery raises temporarily due to refresh operation. Refresh operation pauses at occurrence of this event, thus the temperature drops. Refresh operation is resumed after the battery is cooled down. Upon completion of refresh operation, the current cache mode is changed to "Write Back". If "Write Through" is retained even after 24 hours, the battery may be faulty. Replace the battery.

Event ID508:

When the RAID controller has additional battery (N8103-123 or N8103-124), the following message is registered in RAID log in Universal RAID Utility and OS log (Event Log of Windows, syslog of Linux).

Source:	Raidsrv
Event ID:	508 (800001FC)
Type:	Warning
Description:	<RU0508> [CTRL: RAID controller number] The battery status is unstable.

❑ Wait for about 15 minutes, then check the cache mode of the RAID controller. If the current cache mode is set to "Write Back", it is not a problem in operating the system.

→ If the current cache mode is set to "Write Through", the battery need to be refreshed. Contact your service representative.

If "Write Through" is retained even after 9 hours from start of refresh operation, the battery may be faulty. Replace the battery.

❑ Is battery connected immediately before?

→ This event may be logged until the refresh operation of battery is completed.

Access LED flashes:

❑ Access LED flashes frequently even while the hard disk drive is not accessed.

→ The Access LED flashes if Patrol Read is running. With SATA hard disk drive, the LED may stay on.

Problems with N8403-018 FibreChannel Controller

The names of the FibreChannel Controllers may appear with different names on Device Manager:

→ Refer to the User's Guide of your CPU Blade for details.

COLLECTING EVENT LOG

If an error occurs on the CPU blade and Storage and I/O Blade, you can collect the log of various events to acquire necessary information.

For how to collect event log, refer to the User's Guide of CPU Blade.

IMPORTANT:

- Consult with your service representative before collecting event logs.
- Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system may result in collecting improper data.

MAINTENANCE TOOLS

The Maintenance Tools is used for preventive maintenance, error analysis of this product.

Refer to the User's Guide of CPU Blade for how to use Maintenance Tools.

Function of Maintenance Tools

The following functions can be executed for the Storage and I/O Blade in the Maintenance Tools.

- Test and diagnostics

  Execute various tests on the CPU blade to check if the CPU blade works normally and if the connection between the CPU blade, Storage and I/O Blade, and additional board is normal.

  After the Test and diagnostics is executed, a system check program assigned to each CPU Blade starts.

Chapter 9

Upgrading Your Storage and I/O Blade

This chapter describes optional devices available for the Storage and I/O Blade, procedures for install or removing such optional devices, and notes on using them.

IMPORTANT:

- Optional devices described in this chapter may be installed or removed by any user. However, NEC does not assume any liability for damage to optional devices or the Storage and I/O Blade or malfunctions of the system resulted from installation by the user. NEC recommends you ask your service representative for install or removing any optional devices.
- Make sure to use only optional devices and cables authorized by NEC. Repair of the system due to malfunctions, failures, or damage resulted from installing such devices or cables will be charged.
- When you made any change to the hardware configuration, make sure to update the system (refer to the manual that comes with your CPU blade for details.).

SAFETY NOTES

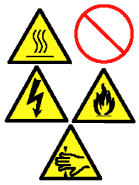
Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING

Observe the following instructions to use the Storage and I/O Blade safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-2 to 1-6 for details.

- Do not disassemble, repair, or alter the Storage and I/O Blade.
- Do not remove the lithium or Li-Ion battery.
- Do not handle the Storage and I/O Blade with the power cord being plugged to a power source.

⚠ CAUTION



Observe the following instructions to use the Storage and I/O Blade safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-2 to 1-6 for details.

- Make sure to complete device installation.
- Do not install the device with its cover being removed.
- Do not pinch your finger(s) with component.
- Avoid installation in extreme temperature conditions.

ANTI-STATIC MEASURES

The Storage and I/O Blade contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- Wear a wrist strap (an arm belt or anti-static glove).

  Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

  Touch a metal part regularly when working with components to discharge static electricity.

- Select a suitable work space.
  - Work with the Storage and I/O Blade on the anti-static or concrete floor.
  - When you work with the Storage and I/O Blade on a carpet where static electricity is likely to be generated, make sure take anti-static measures beforehand.

- Use a work table.

  Place the Storage and I/O Blade on an anti-static mat to work with it.

- Cloth
  - Do not wear a wool or synthetic cloth to work with the Storage and I/O Blade.
  - Wear anti-static shoes to work with the Storage and I/O Blade.
  - Take off any jewels (a ring, bracelet, or wrist watch) before working with the Storage and I/O Blade.

- Handling of components
  - Keep any component in an anti-static bag until you actually install it to the Storage and I/O Blade.
  - Hold a component by its edge to avoid touching any terminals or parts.
  - To store or carry any component, place it in an anti-static bag.

CONFIRMATION AFTER INSTALLATION/REMOVAL

Confirm the following after installing an additional option and removing a component:

- Installing removed components exactly as they were

  Install the components and cables, which were removed and disconnected for addition of an option, exactly as they were. Assembling without a component being installed or a cable being disconnected causes the Storage and I/O Blade to malfunction.

- Confirming that no parts such as screws are left in the Storage and I/O Blade

  Confirm that particularly conductive parts such as screws are not left in the Storage and I/O Blade. Turning on the power with a conductive part on the mother board or cable terminal causes the Storage and I/O Blade to malfunction.

- Confirming the cooling effect in the Storage and I/O Blade

  Confirm that the ventilating holes are not covered with an internally connected cable. Insufficient cooling effect raises the internal temperature, which causes the Storage and I/O Blade to malfunction.

- Confirming operation with a tool

  Some additional devices require the diagnostic utility or BIOS SETUP utility to check if they are installed correctly. For details, see the procedure for additionally installing the target device.

PREPARATION FOR INSTALLATION

To install or remove an optional device in the Storage and I/O Blade, you should first remove the Storage and I/O Blade from the Blade Enclosure. See Chapter 3 for details.

NOTE: You may install or remove the hard disk drive while it is being installed in the Blade Enclosure.

INSTALLATION/REMOVAL PROCEDURE

Install or remove the devices in the following procedure.

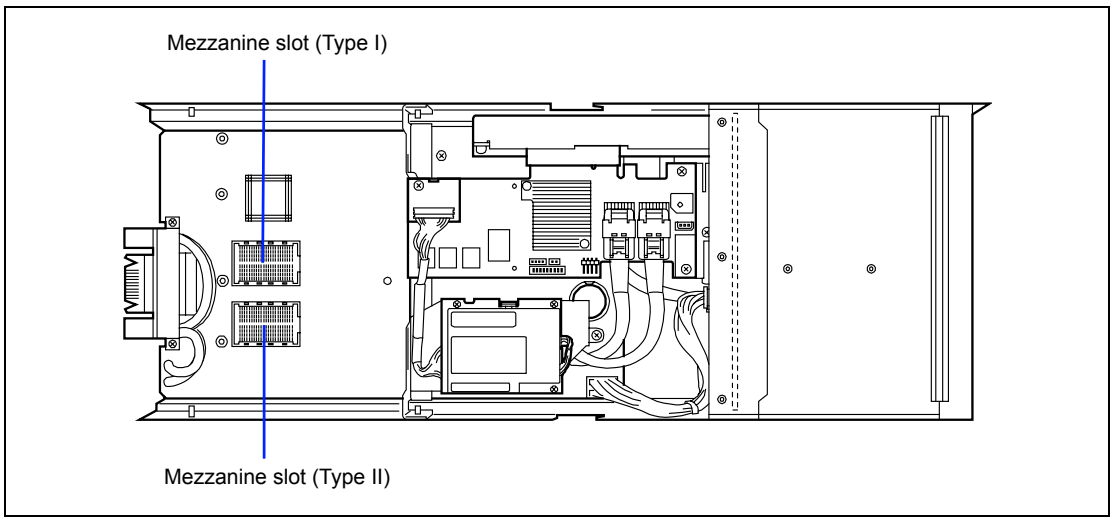
Mezzanine Card

The Storage and I/O Blade can contain two mezzanine cards for blade. To install a mezzanine card, use the mezzanine card slot installed on the CPU unit.

IMPORTANT:

- The mezzanine card is extremely sensitive to static electricity. Make sure to touch the metal frame of the Storage and I/O Blade to discharge static electricity from your body before handling the mezzanine card. Do not touch the terminals and parts on the mezzanine card by a bare hand and place the cards directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- A combination of boards that can be installed in the Blade Enclosure is under certain restrictions. Contact your service representative for details.

NOTE: Some optional mezzanine cards use expansion ROMs on the boards. Refer to the manual provided with the board to check whether the expansion ROMs should be expanded. Use the BIOS setup utility "SETUP" for the setting. See Chapter 4 for details.



Notes

Note the followings in the installation or removal of the mezzanine card.

- Be careful not to make your hands touch the terminals of the mezzanine card slot directly. Otherwise, the oil and/or dirt on the hands may adhere to the terminals to result in contact failure.
- For the option ROMs on the unbooted mezzanine card, set "Disabled" with the BIOS SETUP utility.

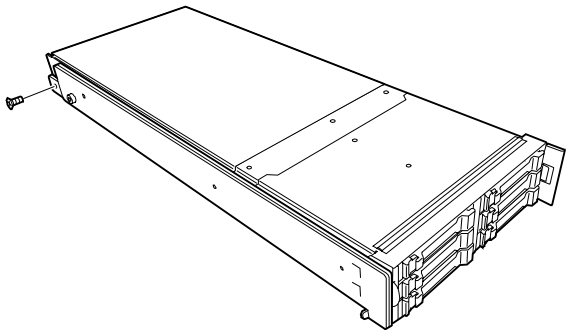
Installation

Install a mezzanine card in mezzanine card slot in the following procedure.

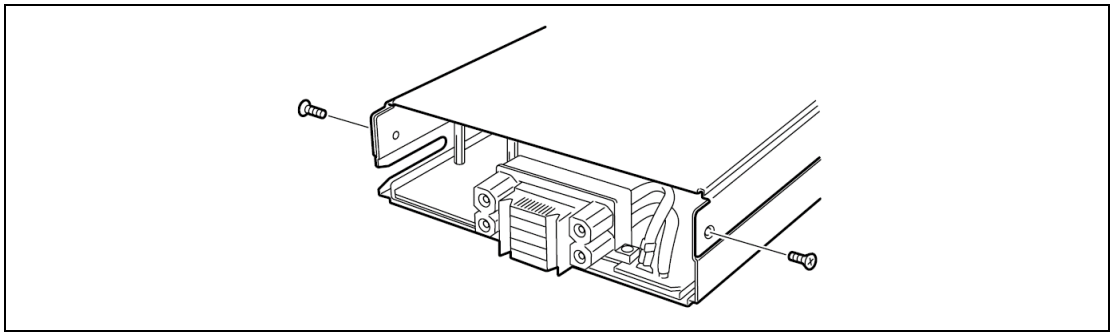
IMPORTANT: There are two types of mezzanine card for blade, Type I and Type II.
The Type I mezzanine card can be installed in either of connectors Type I and Type II.
The Type II mezzanine card can be installed in Type II connector only.
To install the Type I mezzanine card, start installation from the bottom slot (for Type I).

NOTE: Before installing mezzanine card, make sure that the shape of mezzanine card slot matches with that of connector of the option card.

1. After the shutdown processing for the CPU blade in the slot adjacent to the Storage and I/O Blade to be removed, turn off the power of the CPU blade. The Storage and I/O Blade is powered off automatically.
2. Pull out the Storage and I/O Blade from the Blade Enclosure.
3. Place the Storage and I/O Blade on anti-static sheet with little dust.
4. If N8403-032 joint bracket for AD106a is mounted, remove a single screw, then remove the joint bracket from the chassis.

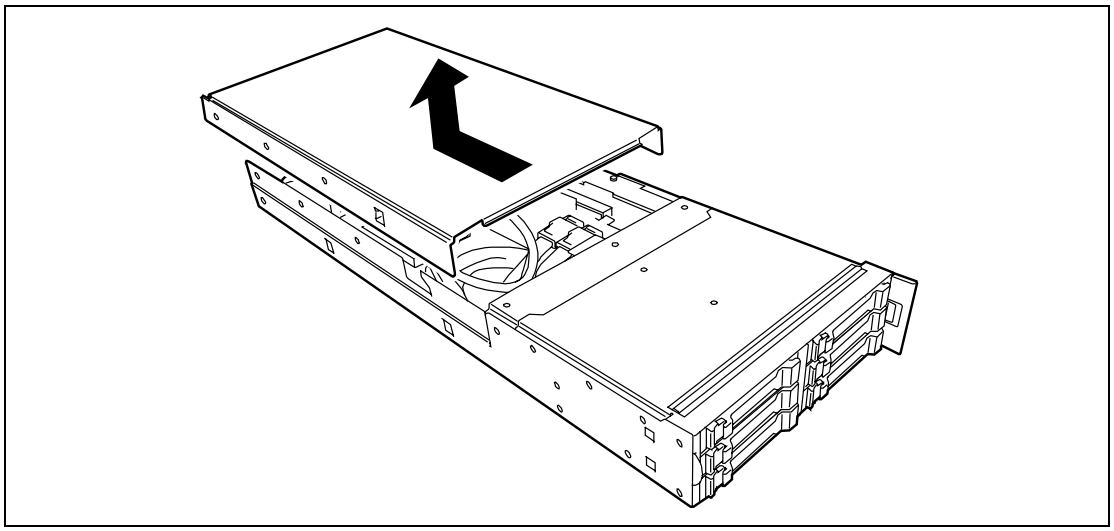


5. Remove the two screws fixing the top cover.



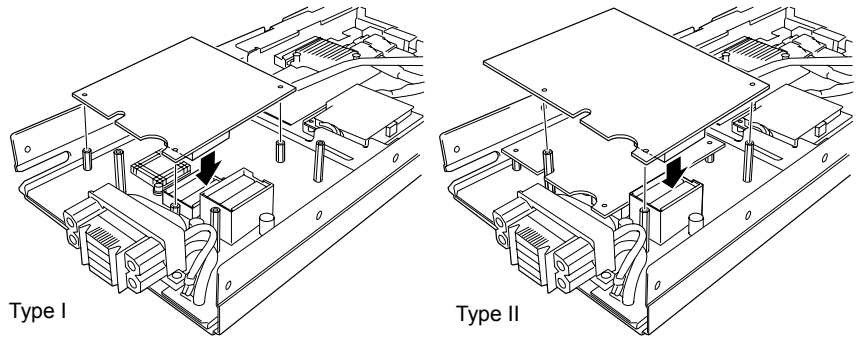
6. Firmly hold the cover, move it slightly toward the rear of the blade, then lift the cover to remove it from the Storage and I/O Blade.

IMPORTANT: Handle the cover carefully so as not to make it contact with any electronic components on the Storage and I/O Blade.



7. Make sure the location of mezzanine card slot you are going to install.

8. From top of the Storage and I/O Blade, position the connector of the mezzanine card so that it aligns the connector of the mezzanine card slot, and insert the mezzanine card straight into the slot.



IMPORTANT:

- Do not make your body contact with the terminals on the board. Some malfunction may occur if the board is installed with dirt and/or oil adhering to the terminals.
- Insert the mezzanine card straight into the connector. The terminal or connector may be damaged if it is inclined.
- If the board cannot be installed securely, remove the board once and then install it again. Adding excess force to the board may cause the board to be damaged.

9. Push the connector portion of the mezzanine card with fingers firmly to connect the card to the slot.

10. Tighten the fixing screws to fix the mezzanine card to the Storage and I/O Blade.

11. Install the top cover having been removed.

12. Secure the top cover with two screws.

13. Secure the joint bracket for AD106a having been removed with a single screw.

14. Install the Storage and I/O Blade having been removed to the Blade Enclosure.

15. Turn on the power of the CPU blade. Make sure that any error messages associated with the board do not appear on the POST screen.
Refer to the User's Guide of CPU Blade for details of POST error messages.

16. Run BIOS SETUP of CPU blade, and select [Advanced] – [Reset Configuration Data] on the [Advanced] menu and set to [Yes].
This is required to update the hardware update information. Refer to the User's Guide of CPU Blade for details.

17. Run the BIOS configuration utility of the installed board to provide setup for the board.
The existence of the utility and its start and operation procedures vary depending on the type of the board. Refer to the documentation coming with the board for details.

Removal

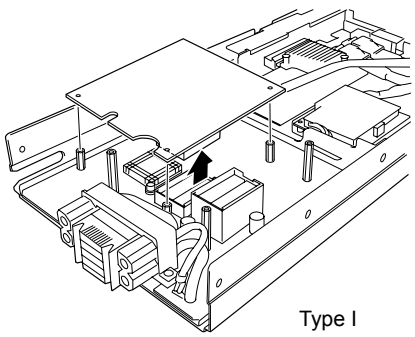
To remove the board, follow the procedure below:

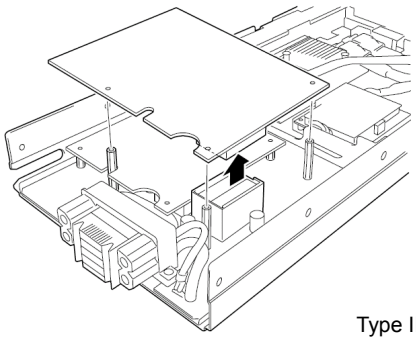
1. After the shutdown processing for the CPU blade in the slot adjacent to the Storage and I/O Blade to be removed, turn off the power of the CPU blade. The Storage and I/O Blade is powered off automatically.
2. Pull out the Storage and I/O Blade from the Blade Enclosure.
3. Place the Storage and I/O Blade on anti-static sheet with little dust.
4. If N8403-032 joint bracket for AD106a is mounted, remove a single screw, then remove the joint bracket from the chassis.
5. Remove the two screws fixing the top cover.
6. Firmly hold the cover, move it slightly toward the rear of the blade, then lift the cover to remove it from the Storage and I/O Blade.

   IMPORTANT: Handle the cover carefully so as not to make it contact with any electronic components on the Storage and I/O Blade.

7. Remove the three screws from the mezzanine card.
8. Hold both ends of the mezzanine card and pull out the card from the slot.

   Lift the card perpendicular to the Storage and I/O Blade.

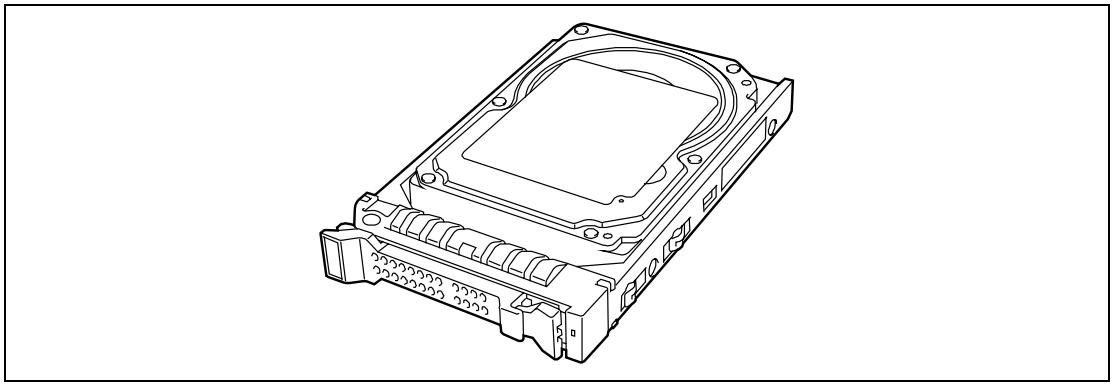




9. Install the top cover having been removed.
10. Secure the top cover with two screws.
11. Secure the joint bracket for AD106a having been removed with a single screw.
12. Install the Storage and I/O Blade having been removed to the Blade Enclosure.

Hard Disk Drive

The Storage and I/O Blade can contain up to six 2.5-inch hard disk drives. This section describes the installation and removal procedure.



IMPORTANT:

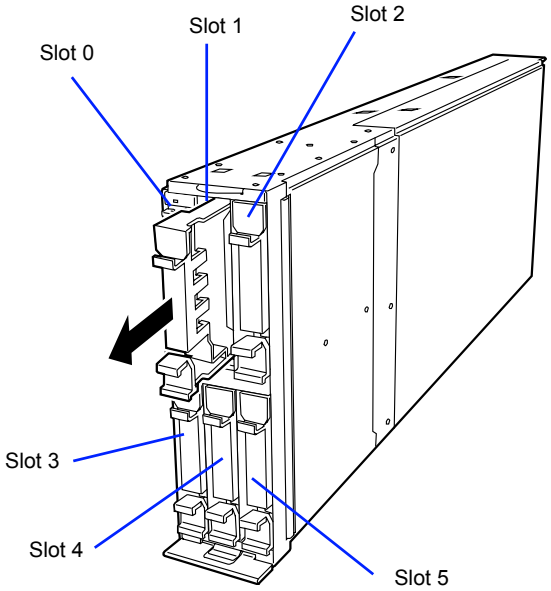
- The hard disk drive is extremely sensitive to static electricity. Make sure to touch the metal frame of the Storage and I/O Blade to discharge static electricity from your body before handling the hard disk drive. Do not touch the terminals and parts on the hard disk drive by a bare hand and place the hard disk drive directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Do not use any hard disk drives not approved by NEC. If an unapproved third party's hard disk drive is installed in the Storage and I/O Blade, not only the hard disk drive but also the Storage and I/O Blade may be defected.
- If hard disk drives of different disk capacities co-exist in the Storage and I/O Blade, the unit can operate normally. However, the hard disk drives configuring the disk group (DG) should have the same capacity and rotation speed.
- Pay attention not to apply shock or vibration to the hard disk drive. Do not push the surface of the hard disk drive when installing or removing the hard disk drive. Doing so may cause a failure of the hard disk drive.
- Use the hard disk drive mounted on the tray dedicated to the Storage and I/O Blade. Do not remove the hard disk drive from the tray to mount any other hard disk drive. Doing so may cause a failure of the hard disk drive.

Installation or Removal of Hard Disk Drive

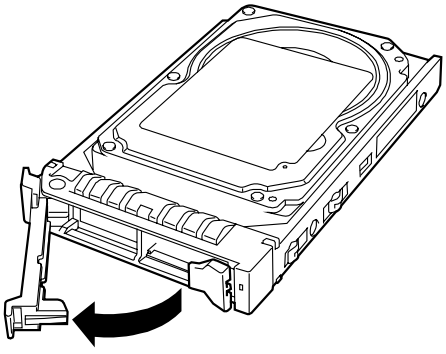
Install the hard disk drive in the following procedure. Install the hard disk drive in slot 0, 1, 2, 3, 4, then 5 in the order.

1. To install a hard disk drive in the slot 1 and the subsequent slot, remove a dummy tray from the slot before installing a hard disk drive.

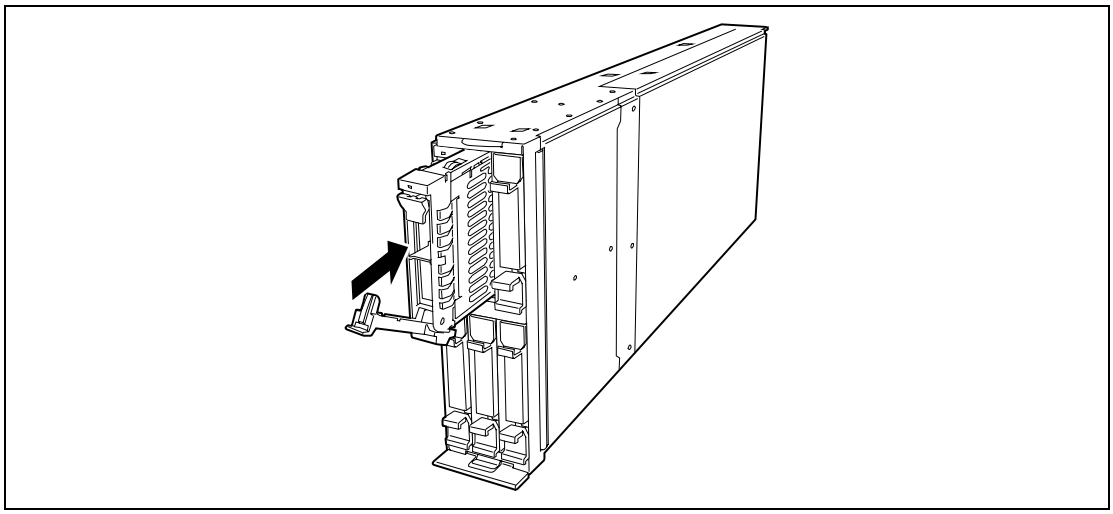
IMPORTANT: Keep the removed dummy tray for future use.



2. Unlock the lever on the hard disk drive to make the handle opened.



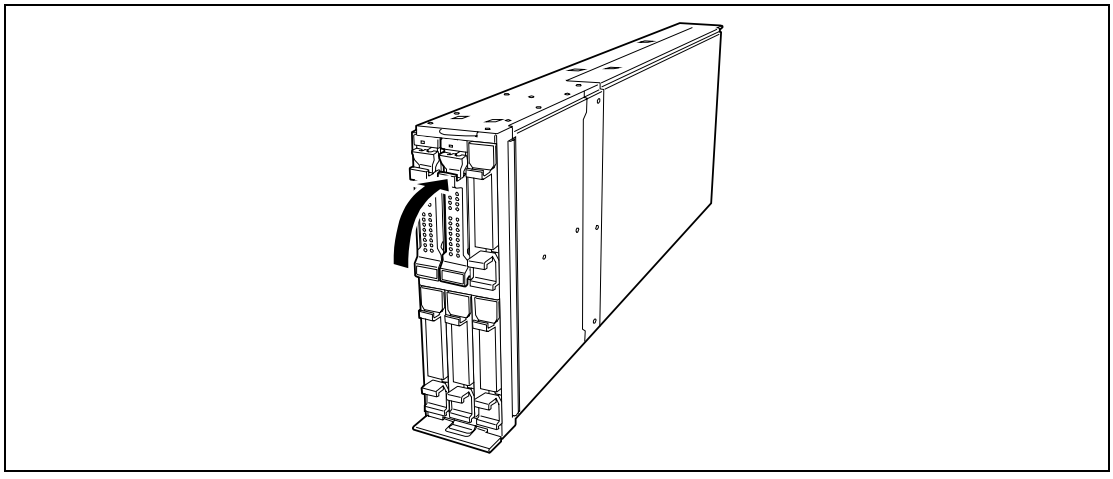
3. Hold the hard disk drive so that its BP connector faces the hard disk drive slot and the lever on the front of the drive carrier faces the top.
4. Insert the end of the drive carrier into the hard disk drive slot slowly and carefully.



5. Insert the drive carrier until it hits the slot end, and pull up the lever.

   Then the hard disk drive is locked with clicking sound.

NOTE: Make sure that the hook of the lever is hung on the frame.



The removal procedure is the reverse of the installation procedure.

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Appendix A

Specifications

Item		Storage and I/O Blade AD106a
		N8404-001F
Hard disk drive	Standard	None
	Maximum	1800 GB (300 GB × 6)
RAID	Cache size	128 MB
	RAID level	0, 1, 5, 6, 10, 50
	Battery	Factory installed
	Max. No. of logical drives	64 (16 max. per disk group)
Mezzanine card slot	Type 1	2 max. (when Mezzanine Card Type 2 is not used)
	Type 2	1
LAN interface		1000Base-T × 2
External dimensions (mm)		181 (H) × 516 (D) × 52 (W)
Weight		11 kg Max.
Power supply		+12Vdc (supplied from the Blade Enclosure)
Power consumption (+12Vdc)		240 W
Environmental requirements	Temperature	10 to 35°C
	Humidity	20 to 80% RH (no condensation)

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